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Original Articles

The Value of Medical Treatment of Peptic Ulcer[1]

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I wish to call your attention for a few minutes to some of the recent facts regarding the question of round ulcer. The physician's demand to-day is a basis for treatment, some rational procedure calculated to aim at cause and effect. The surgeon in his technique aims at the effect. The physician aims to relieve the effect, but also aims, if possible, at the cause. Within recent years comparatively little has been added to our knowledge regarding round ulcer. We might state that the newer knowledge of this subject includes the following facts:

First, the relatively greater incidence of duodenal compared to gastric ulcer—three to one according to Moynihan, four to one according to the Mayo Clinic, and from my own personal statistics I find the incidence to be somewhere in the neighborhood of three to one.

Secondly, there is considerable evidence to demonstrate that there are vital differences between true ulcer of the duodenum and ordinary round ulcer of the stomach. Moynihan has pointed out that the chemistry of duodenal ulcer is different from the chemistry of gastric ulcer. In 72 per cent of cases he found the chemistry of duodenal ulcer to be of the high secretory type. In 79 per cent of 100 cases of ulcer of the duodenum we found a terminal high secretion. In a group of gastric ulcers only a little over 30 per cent showed high acidities, while in the small group of gastric ulcers which I was able to observe only 38 per cent of them showed that type of secretion. In other words, there is something about a lesion of the duodenum which produces an alteration in gastric chemistry.

In the third place, we now have fairly accurate statistics regarding the value of surgery in chronic round ulcer. From all the statistics that I can gather, the patient who goes on the operating table stands 88 per cent of chances of a cure. In 12 per cent of cases he faces the possibility of jejunal ulcer, adhesion formation, recurrent ulcer, possible slow leak, alterations in physiology of the stomach, and the failure of that organ to do what it should do after a satisfactory operation—that is, to show a marked reduction in gastric acidity and also a much more rapid evacuation.

The medical treatment of ulcer of the stomach aims at the rearrangement of gastric function. All the experimental evidence that I can obtain regarding ulcer seems to indicate that the lesion will heal rapidly if conditions are satisfactory. Clinical ulcer, however, heals slowly, and medical men as a rule are satisfied that the acidity of the gastric juice is not the provocative agent in the formation of ulcer, but the greatest single factor inducing ulcer chronicity. There is a great deal of evi-

[1] A paper read before the Philadelphia County Medical Society.

dence to show that ulceration has a tendency to heal. Many ulcers heal spontaneously without treatment, and certainly a large number of cases heal under careful treatment. The key-note of ulcer treatment to-day is the establishment of three factors: first, gastric rest; second, nerve sedation; and third, neutralization of the gastric secretion. Within the last two years almost to a unit the most intelligent members of our profession were of the belief that the fundamental deviation back of ulcer production was a devitalization of the gastric cell. What caused this disturbance in cell viability was open to conjecture. Whether it was focal infection, a nerve lesion, a circulatory defect, a vicious cycle of the upper digestive tract—all of these types have their champions—the fact remains that in some way certain portions of the upper digestive tract, particularly those associated with the greatest amount of mechanical work and most highly organized nervously, are susceptible to ulcer production.

With minor variations the treatment adopted throughout the world to-day has been one of starvation, careful feeding, neutralization of free acidity, the use of sedatives and antispasmodics. In almost every instance of simple, uncomplicated ulcer the patient is rapidly relieved, but two very definite truths have issued from the universal practice of this procedure. One is that the symptomatically free patient is not a cured patient, and the second is that the individual with negative occult blood reaction in his stools is not a cured patient. Practically every patient with uncomplicated ulcer after a month's treatment with starvation, rest and neutralization leaves the hospital free from pain, free from discomfort, free from ulcer symptoms, and usually with an increase of weight. If he does not, then the physician immediately thinks of an old indurated ulcer, of a mechanical defect, of the possibility of malignant degeneration, or what is more frequent than all of these three, of the possibility of some inflammatory focus elsewhere such as the gall-bladder, or the appendix, or some other inflammation in the abdomen. On the other hand, the greatest danger is to allow these apparently cured individuals to appear at large, and this is precisely the reason why medical treatment has been held in general disrepute in all cases of confirmed ulcer. In my experience when all symptoms have disappeared there is still fluoroscopically and roentgenologically evidence of persistent ulceration, and in the last few years I have observed more than 100 cases of ulcer of the duodenum and a smaller number of cases of gastric ulcer carefully at intervals. Many of these cases were submitted to the regular routine hospital procedure.

As I summarize the findings in these cases it is evident to me that in not more than 30 per cent is there definite evidence of a disappearance of the lesion even after a month, and in many of these cases after three months of persistent treatment there is still evidence of a definite defect which can only be attributed to persistent ulceration.

From a study of the histories of my cases the average duration of symptoms in ulcer of the duodenum in this group of 100 is 7½ years. Some of them have lasted for more than 20 years, and it is manifestly impossible in a short period of one month to six weeks to control a lesion of that long duration. It was for that reason several years ago that I became converted to the ambulatory plan of treatment. In other words, it seemed evidently impossible to produce a cure, at least of duodenal ulcer, in the ordinary short period which is commonly assumed to produce that result. In gastric ulcer, even with a distinct niche, it is possible to produce a marked lessening and even disappearance in from two to three weeks. I have repeatedly seen this phenomenon, and in three cases of gastric ulcer in the last year where the niche was of the perforating variety, there is no evidence to-day of any defect on the gastric wall. This is much more difficult to produce in ulcer of the

duodenum, and the only satisfactory method of medical treatment which produces results that I can see is a method of continuous medical treatment over months and even years. I have a small group of cases which have defects after more than two years of continuous treatment. These defects can be considered to be scars, and it can be observed that the healing ulcer of the duodenum will produce a scar. Nevertheless, I feel that as long as there is a demonstrable irregular defect involving the cap of the duodenum of the nature commonly found in ulcer of the duodenum, it is necessary to inaugurate or to continue medical treatment. It is possible within one month to two months to produce marked changes in the general arrangement of the defect. This is probably owing to the disappearance of spasm, periulcerous edema, and the phenomena associated with ulceration.

The medical problem in the treatment of gastric ulcer resolves itself into gastric rest, the introduction of a diet which promotes a comparatively rapid evacuation and either low secretory output or high combining power. There is no question that starvation produces approximation of the gastric walls and approximation of the walls of the ulceration, a low secretory output of low velocity measuring relatively one-half the total and one-half the free acidity of the digesting stomach. However, in my experience, even ten days of starvation fails to produce any marked disappearance in the defect produced by duodenal ulcer. The passing of a tube into the duodenum is considered undesirable by the most recent experimental evidence. Garbat has shown that the introduction of material into the duodenum is followed by an appreciable rise of pure gastric secretion in the stomach. This I have confirmed on three occasions by a double intubation of both the stomach and the duodenum.

Regarding the question of food evacuation, undoubtedly the indication is for foods which leave the stomach rather rapidly. The rule has been that carbohydrates fully complied with this indication. We found that normal fast stomachs handled most of the raw vegetables and many of the cooked vegetables within one hour. We also found that such substances as the white of egg and even poached eggs will leave the stomach in one hour to one and a half hours. Puddings leave the stomach in a little over two hours, and the meats as a rule leave the stomach in from two and a half to three hours and fifteen minutes. This includes all the varieties of meat, poultry, and fish. Material with the fast stomach takes about two and a half hours for 8 ounces of milk. The slow stomach is a little bit different and on an average represents more than 40 per cent of normal individuals. In that group of cases we find the raw white of egg takes two hours and fifteen minutes, while the meats take from three to four hours and fifteen minutes for 100-gramme portions. It follows therefore that we must confine ourselves to the starchy vegetables, the cereals, the prepared milks, and those substances which in themselves in health demand a comparatively short evacuation period.

In our studies on acid values it was found that with an Ewald meal the acidity produced was normally from 50 to 70 total acidity. The cereals and vegetables on the other hand produce in all types of normal individuals an acidity averaging from 60 to 70 total. Eggs produce an average total acidity of 80, while all the meat products produced in some portion of every gastric response an acidity exceeding 100. In the latter group, however, there was considerable evidence of high combining value. It therefore follows that for rapid evacuation and low secretory production the carbohydrates and only a few of the proteins answer this demand. For instance, in the study of milk it was clearly shown that boiled milk produces the smallest possible curds. This undoubtedly accounts for its complete digestion and its tendency toward constipation. Whole milk is curded rapidly, and considerable has been written regarding the curds of whole milk, but much of

this does not bear the scrutiny of careful investigation. Milk and cream gives soft curds and leaves the stomach in from two and a half to three hours and has considerable combining power. It is therefore taken as the basis of the Sippy treatment.

The other question of importance is the form of antacids to be employed. Quite recently two important communications have appeared: one by Hardt and Rivers, in which they demonstrated that the systematic employment of alkalies according to the method of Sippy produced toxic manifestations in certain groups of cases. These toxic manifestations they believe were due to a renal disturbance, inasmuch as the blood chemistry studies demonstrate nitrogen retention.

Kantor (*J. A. M. A.*, 81; 816, Sept. 8, 1923) pointed out that it was much more desirable to use substances which acted locally as antacids rather than substances which produced systemic alkalinization, and therefore suggested that tertiary phosphates of calcium and magnesia be employed. In a more recent communication Shattuck, Rohdenburg and Boohler (*J. A. M. A.*, Jan. 19, 1924, 200) studied this subject and came to practically the same conclusion as Hardt and Rivers, namely, that a certain number of individuals who received alkaline treatment developed toxic symptoms. They not only demonstrated the adequacy of employing the calcium and magnesia phosphates, but they also studied the relative combining power of these various salts. These findings are rather interesting. For instance, ½ gramme of magnesium phosphate will neutralize 0.402 gramme of HCl in 120 minutes. The same amount of heavy oxide of magnesia will neutralize 0.829 in 135 minutes. One-half gramme of calcium carbonate will neutralize 0.782 gramme of HCl in 20 minutes, while ½ gramme of sodium bicarbonate will neutralize 0.45 gramme of HCl in two minutes. Calcium phosphate, on the other hand, in the same dose will only neutralize 0.104 in fifteen minutes. In other words, magnesium phosphate will neutralize practically the same amount of HCl as does sodium bicarbonate, but takes a much longer time to do it, which is more desirable, while the tertiary phosphates of calcium will neutralize only one-fourth as much. They claim that 10 to 25 grains of the magnesium phosphate and calcium phosphate every hour will enable one to neutralize the free acidity without inducing any serious systemic change. This is a step in the right direction, inasmuch as it is evident that until we know more about the actual etiology of gastric ulcer we must continue to control that factor which is probably the greatest single one in inducing chronicity.

Our method of procedure is as follows: The patient is put through a systematic survey, including the history, general physical examination, intubation, and the routine laboratory procedures as well as fluoroscopy and roentgenography. If the latter demonstrate a lesion and all other methods of examination favor that interpretation, then the patient is considered to be suffering from peptic ulcer. If the *x*-ray findings are negative and all other findings point to ulcer, we feel confident that the case is safely a medical one and may be treated along these lines. This is the rule of several European clinicians. If the result of examination justifies us in the belief that the condition is ulcer, then the question naturally gravitates around the question of the form of treatment to be adopted. All ulcers showing extensive deformity with fixation to adjacent viscera are surgical. All gastric ulcers with a crater larger than a five-cent piece are surgical owing to the danger of malignancy, and all cases of organic pyloric stenosis are naturally surgical. But the average type of ulcer without retention vomiting, with simply a deformity with little or no persistent enlargement of the stomach, with no twelve-hour retention, and possibly only a small six-hour retention, can frequently be totally changed by adequate medical treatment. I have seen twelve-hour retention totally

disappear by medical treatment, and it must constantly be borne in mind that such a finding may be evidence only of an acute alteration with temporary gastric dilatation. I have seen that finding so often that it does not alarm me as it did in the years gone by. There are more than one dozen such cases that I know of in which present examination after prolonged medical treatment fails to reveal a single symptom objective or subjective of their former condition.

If, then, medical treatment is decided upon, the next step is the type. In all acute accidents, such as hemorrhage, acute hypersecretory crises, painful crises of spasm with vomiting, it is well to begin ulcer treatment with complete rest in bed. This includes complete rest, complete starvation, rectal feeding, preferably by the Murphy drip, and glucose solution to which tincture of belladonna has been added, and the control of all subjective symptoms by rectal suppositories containing appropriate sedatives. This period should be continued for the duration of one week if possible, and is to be followed by the second period of restricted feeding. Many clinicians give a feeding every hour during this period and antacids between the feedings. Inasmuch as I prefer boiled milk or citrated peptonized milk, I give the feedings every two hours throughout the day from eight to eight, and give antacids midway between the feedings. The patient still receives a daily cleansing enema, and before three of the feedings belladonna, and if necessary bromides. In all recent cases, in which we have decided on extensive antacid medication, we examine the blood chemistry, and any perceptible increase in blood urea or uric acid calls for caution.

This exclusive milk feeding is maintained until the patient is symptom-free and occult blood-free. In my experience on the seventh or eighth day the patient is usually symptom-free, and if he is not the ulcer may be indurated, malignant, or there is more often associated some other inflammatory focus in the abdomen. As soon as the all-subjective symptoms have disappeared, the feedings are arranged at two-and-one-half-hour intervals with neutralization half-way between, and thoroughly cooked cereals, first the whites and later the yolks of eggs, puddings, cream soups, the purées of the starchy vegetables, rice, macaroni baked in milk, some of the finely done greens. The gelatin preparations are gradually added to the menu. Finally toast and butter are added, *but all through this period the patient is kept under the influence of belladonna and sedatives and neutralizing agents are exactly spaced between the meals.* This second period of restricted ulcer feeding is kept up until on *x*-ray there is evidence to indicate that the lesion is healing. This period may be two weeks or two months, and it is perfectly possible to make it an ambulatory treatment.

During ulcer treatment attention most naturally should be directed to the care of the mouth, the removal of foci of infection, to the use of enemas, irrigations and means for insuring complete evacuation of the bowels, to the care of the skin, and finally to the use of any other adjuvant to treatment, such as the administration of vaccines from autogenous sources, and even deep *x*-ray therapy such as has been suggested by Continental authors. I have seen a deep ulcer niche on the lesser curvature completely disappear under such treatment carried out in an ambulatory fashion without any rest in bed, and sedation only such as might be obtained by atropine sedatives and antacids.

The point I wish to emphasize, however, is that such treatment as I have mentioned merely serves to inaugurate the ulcer cure. In some gastric cases it is possible to demonstrate a disappearance of the lesion; in chronic duodenal ulcer it is rarely possible to demonstrate marked changes. The medical treatment of this condition calls for long and protracted treatment, which can only be carried out by some ambulatory method. Of that I am thoroughly convinced by repeated observation.

It is for that reason that the average

chronic case of ulcer is best adapted to an ambulatory method. Where acute phenomena do not appear it is my practice to begin immediately with the above ambulatory method, insisting on an exact dietary followed as nearly as possible on the hour, by neutralization followed likewise by clock, by systematic administration of sedatives and antispasmodics calculated to short-circuit as much as possible conscious impulses, controlled by interval examinations which may or may not justify an increase in the dietary. Following such a plan, with the other precautions which are to be taken in each case, such as the control of focal infections, the care of the bowels, total abstinence from smoking, it is possible to demonstrate unquestioned evidence of reparative processes. The patient should be trained to care for himself dietetically and medically precisely as do the tuberculous and the diabetic, and when the clinician realizes this and controls his findings with the fluoroscope as the internist controls his diabetic by the estimation of blood sugar, we shall be in a better position to estimate the value of precise medical treatment. The results of ambulatory treatment in the last one hundred cases on my files which I have diagnosed as duodenal ulcer have been most gratifying. I lost one case through hemorrhage, but it was a case complicated with hypertension, interstitial nephritis, and an absolute inability to learn how to follow orders. Only this morning I was notified of a case I saw some five years ago, diagnosed as duodenal ulcer, which had apparently a severe hemorrhage. This patient happened to be a member of the medical profession, but he followed every law that a round ulcer case ought not to. He smoked, he ate immoderately, he lifted heavy weights, and freedom from pain spelled to him relief from ulcer.

With considerable caution and hesitancy I state that to my knowledge no person who thoroughly understood his condition and faithfully followed its indications in this series developed perforations. I realize how treacherous duodenal ulcer can be, but constant and practically daily observation have confirmed my belief in two fundamental points regarding ulcer therapy: first, that there is a long period in the evolution of round ulcer whether duodenal or gastric where it is entirely curable medically, and secondly, that the only hope of medical cure is persistent dietetic and medicinal treatment not carried out for weeks, but for months or years, until there is tangible objective evidence of its disappearance. This is no more than the surgeon imposes when he commits a patient to gastroenterostomy or any of the plastic operations on the organ. Much could be said of every phase of round ulcer from its etiology through its evolution to its final stages, but I personally have been convinced the secret of success in round ulcer cure is a proper selection of cases and education and persistent dietetic and medicinal treatment of cases until there is tangible objective evidence of their cure. If we fail the brilliant vista of surgery opens up, but if the surgeon fails there is no more abject specimen than the chronic digestive invalid who has knocked on both doors and found no relief.

Cervical Leucorrhea[1]

BY HOWARD A. KELLY, M.D.

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What is to be esteemed little or big in the body depends not so much on the size of an organ involved as upon its frequency and probable relation to health and life. I speak of an affection of the neck of the womb which has engaged the attention of the profession for centuries, and yet one which we hardly seem to understand so well to-day as, say, a hundred years ago, a disease which holds an important relation to health and comfort and which, if neglected, often, I believe, eventuates in a trouble terminating life. I speak of a uterine infection with a cervical leucorrhea, a chronic disease causing a constant profluent, tenacious discharge, either clear and albuminous or mucopurulent in character, commonly grouped by the general practitioner first consulted under the vague general heading "leucorrhea," and, as such, treated with douches, cleansings, paintings, and astringents, which, however, have never yet cured this affection. Too often I believe that even those who devote some particular attention to diseases of women also fail to recognize in this disease an entity which has its marked individual characters and which invariably originates in and occupies one locality in the pelvis and no other. Vaginal discharges proceeding from a vaginal leucorrhea are never mucoid and ropy or stringy in character, while these are the very earmarks of this disease. Also when the vagina is inflamed, inspection reveals a more or less uniformly mottled, reddened organ, bathed with whitish, creamy or yellow pus or with a curdy discharge; in cervical leucorrhea a puddle of tenacious, albuminous discharge, clear or opaque, lies in the vaginal vault and is seen flowing like a lava stream out of the cervix (Fig. 1), which is plugged by it, while the cervix itself is enlarged, reddened, puffy, with a more or less everted mucosa. If the cervix is lacerated by childbirth, it may be enlarged to several times its original size, and exhibit an extensively everted, thickened mucosa with numerous more or less evident cysts, clear or mucopurulent. This eversion of the edematous mucosa often obscures even a deep laceration, while it looks so red and angry that it is dubbed by the inexpert an "ulceration," "erosion," or even "cancer"; as a matter of fact, it is in nearly all cases an ectropium of the cervical mucosa. The profluent cervicitis is often mistaken for an endometritis, a relatively rare disease, with which it has nothing in common, and which is not characterized by profuse or

FIG. 1.—The characteristic, clear, tenacious discharge, pouring out of a thickened hyperemic cervix.

mucoid discharge. The mischief of such a mistake is that the erroneous diagnosis invariably leads either to intrauterine treatments or to an aggressive, futile curettage as a remedy.

The discomforts caused by a cervical leucorrhea are either slight and negligible, or those associated with the discharge and the soiling of the person, with sometimes a sense of fulness and bearing down; they are often coupled also with those attendant upon other associated pelvic injuries when

[1]An address before the Philadelphia Obstetrical Society.

it is a sequel to childbirth. Commonest among these are descensus of a uterus in retroposition or reclining in the lower part of the sacral hollow, ovarian displacement, marked pelvic congestion, cystocele, rectocele, and a broken-down vaginal outlet. Under such circumstances often the only speculum needed to expose the peccant cervix is two index-fingers retracting and everting the perineum and lower vagina.

The infected cervix may also form a focal nidus, giving rise to headaches, malaise, lassitude, palpitations, and pains in various parts of the body. My analysis has not been close enough to enable me to say whether demonstrable joint lesions ever arise. I believe that it is almost always gonorrheal in origin in nulliparæ and often so in multiparæ, although the

FIG. 2.—Characteristic charring following linear cauterizations of the inflamed hypersecreting cervix.

gonococcus can but rarely be found on account of the inveterate nature of the ailment.

To recapitulate in part, this condition ought always to receive careful attention:

1. Because it is a source of constant annoyance and interferes with cleanliness.

2. It is a part of the complexity of injuries following labor.

3. It prevents conception and is one of the commonest and most important pathological contraceptives.

4. It endangers health.

5. I believe that in the infected cervical laceration lies our commonest cause of cervical cancer.

Such being the condition, and leaving the etiology somewhat obscure, what is the best we can do in the way of treatment? Specialists neither attach sufficient importance to this ailment nor are they in accord as to its management. As during the two generations past, so to-day cervical leucorrheas haunt the doctor's office, and, like the woman of old, the patients are commonly nothing better, even though they may not be the worse off, by reason of the useless superficial therapeutic manipulations. Boldt with characteristic frankness declared (So. Surg. and Gyn. Trans., xxvi, 1913, p. 153): "There is no condition with which I am acquainted which is more obstinate than one of these cases of chronic endocervicitis. . . . they go on for years, and I do not know what to do with them. I get tired of them. I relieve them, and then they get renewed trouble again." Douches, astringent, solvent, cleansing, hot water prolonged, scarifications and free depletions with (the once fashionable) "Buttle's spear-pointed scarifier," or more liberal treatments with the scalpel, or depletory, dehydrating tamponades with boroglyceride, do in time effect a marked improvement, but at the expense of much labor and loss of precious time.

T. A. Emmet, one of our fathers in American gynecology, with his usual insight recognized the common underlying basis of a laceration with congestion and "cystic degeneration," and pared the torn lips and sewed them together—"Emmet's operation."

Emmet and Gaillard Thomas looked upon a cervical repair as one of their great operations, and in accord with the more deliberate and dilatory tactics of their day they often kept these patients for weeks under preparatory treatments in their private hospitals, in bed, receiving prolonged hot douches, and being regulated in various ways, while appearing at intervals on the office table for scarifications and depletions with glycerin tampons until all cysts were evacuated, the congestion gone, and the cervical lips hung soft and supple. At last a day was set for the operation, which might last an hour or more. Following the operation Thomas at least would telegraph

home to the anxious relatives, say out in Cleveland or Buffalo, that the ordeal was at last over and the patient was apparently doing well. Again, when the stitches were removed, another despatch was wired announcing the culmination, and that the operation had been a great success, which was, of course, bruited among the friends and received by the anxious family with jubilations. Query: Was an operation usually necessary after reducing such an infected cervix to its physiological condition? Personally I rarely do an Emmet cervix operation any more. Still another, a follower of Carl Schroeder, practices an awkward extensive resection of the cervical mucosa; and yet another cuts the Gordian knot by amputating the cervix, the latter often justifiable as a step in a prolapsus operation.

I reach my climax when I declare that the only speedily and invariably satisfactory treatment is that recommended by my colleague, Dr. Guy Hunner, in 1906 and again in 1914, solidly based upon clinical material, much of which we saw in common. Hunner modestly disclaims originality, which, however, must be accorded him in spite of his protest. It is true that the ancients used a hot iron, but under the entirely different

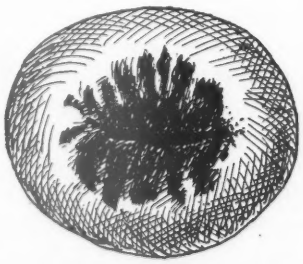

FIG. 3.—More extensive cauterization of the inflamed cervix usually done under anesthesia.

conditions of uncertainty in all their diagnoses, and of their timorous and only tentative applications of remedies. In our day and generation it had been long since relegated to the gynecological waste-basket, where, so far as most are concerned, it still lies. It was just as much, or more, a novel procedure and addition to our therapeutic armamentarium as Fitz's discovery of appendicitis.

My sole mission here is to call attention to the fact that the actual cautery is not only the best but the only rational method of treatment. I would therefore give force to my commendation by adding the totality

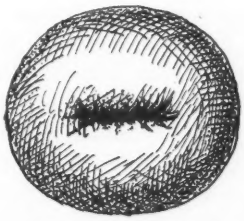

FIG. 4.—The result of cauterization of the infected cervix shown in the greatly diminished size, the normal color of the mucosa, and the freedom from thickening.

of my large clinical experience since we first saw these cases in the Johns Hopkins Hospital. I have no complete failures to record and have seen no ill sequelæ. I have never witnessed an ascending infection, nor seen a cicatricial atresia of the cervix such as the older practitioners chronicled following the use of their favorite caustics of two or three generations ago, such as the acid nitrate of mercury or *potassa cum calce*. For an advanced case, with a cervix infiltrated and greatly increased in size, with numerous cysts and a thickened, everted mucosa pouring out its glairy secretion, my own procedure is as follows: Dorsal posture with well-flexed limbs; vulva (not mons) shaved; vagina swabbed out; cervix exposed with Sims' speculum and lateral retractors; cervix grasped with bullet forceps above the diseased area and drawn down a little. Sometimes I pack a strip of wet gauze about the cervix to cool the acrid fumes. A stout cautery knife heated beyond a cherry red is applied forcibly to the diseased mucosa in six or eight or more areas, either in a longitudinal, linear fashion (Fig. 2), cutting deep half a centimeter or more, or, more commonly, I apply the flat hot blade of the cautery over the whole surface of the diseased mucosa on its posterior and anterior lips;

or again, the knife is plunged straight in at numerous points all around the edges of the disease. The result is a charred, blackened, fissured surface in place of the rolled out, thick, follicular mucosa (Fig. 3). As the cysts are opened, the tenacious secretion constantly escapes, quenching the fire. During the cauterization an assistant blows the smoke away with a long curved glass tube flattened at the end, held close to the cervix. While I have seen no cicatrices at all, I would advise the beginner to try Hunner's plan of making a few linear cauterizations and repeating them at intervals of eight or ten days until the disease is cured. I think it best to use gas anesthesia for an extensive treatment; for lighter ones it is only necessary when the patient is neurotic or unduly apprehensive. Whether the patient remains in the hospital beyond a few hours depends upon herself.

A milder case can often be treated best in the knee-chest posture through one of my slightly conical metal specula with a stout handle with the end of the speculum sequestrating the cervix. The slough forms with surprising rapidity, so quickly, indeed, that it is not well to do this operation and a plastic at the same time for fear of infection. In a younger patient in the parous period, needing an operation for cystocele or rectocele, I prefer to clean up the cervix in this way first, and then, say in three months, to do the operation. In an older patient with marked displacement, cervical resection is best, when there is no delay in operating.

Following cauterization the convalescence lasts several weeks, marked by increased leucorrhea and sometimes a little blood. Hot cleansing alkaline douches twice a day obviate any annoyance, and in about six weeks all the old discharge has ceased and the patient is well and the cervix soft, pink, and entirely natural, and the mucosa, so conspicuous before, has become reinverted into the canal (Fig. 4).

I believe that in this simple but aggressive procedure we possess our best prophylactic agent in combating cancer of the cervix, which is undoubtedly grafted onto a laceration and a focus of chronic inflammation. All suspicious cases should be subjected to a microscopic study of the tissues.

I desire to acknowledge the efficient help of Dr. Eleanor Percival in reviewing all my cases for several years past and analyzing them for this paper.

Goitre: The Rational Discrimination and Treatment

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Goitre is not simply a "lump on the neck." Such a superficial attitude, lacking diagnostic and therapeutic discrimination, is both unscientific and dangerous to the patient. In no condition in medicine is discrimination in diagnosis and individualization in treatment of greater importance to the patient than in thyroid enlargements. To regard all thyroid "lumps" as indications for surgery, or to regard all as being due to a deficiency of iodine requiring iodine administration, or to treat all goitres by *x*-rays, or to adopt any other uniform method of treatment in *all* goitres, leads to dire consequences in a very large percentage of patients and hinders progress.

A Working Classification of Goitre.—Among the many methods employed in classification of goitre, I find the following a satisfactory working basis:

Toxic goitre	Toxic adenoma (hyperthyroidism).	Surgical goitre.
	Diffuse adenomatosis (Goetsch).	
	Puberty hyperplasia.	Non-surgical goitre.
	Exophthalmic goitre (Graves's or Basedow's disease).	
Non-toxic goitre	Simple hypertrophy.	Non-surgical goitre.
	Colloid.	
	Adenoma.	Surgical goitre.
	Cyst.	
	Fibrous.	
	Calcareous.	
	Any combination of the last four.	
	Inflammation of the thyroid (acute, subacute, chronic).	
	Malignant disease.	

From the above classification it will be observed that we might further classify thyroid enlargements therapeutically as follows:

A. *Non-surgical Goitre:*

1. Simple hypertrophy
2. Colloid goitre

} Non-toxic

3. Puberty hyperplasia
4. Exophthalmic goitre (Graves's disease)

} Toxic

B. *Surgical Goitre*, embracing adenomata (simple and toxic), cystic goitre, and all other forms of goitre not mentioned under non-surgical goitre.

From a pathological view-point it will be seen that the four types above designated as *non-surgical* goitre are *unencapsulated*. On the other hand, the common types of *surgical* goitre are *encapsulated*. Barring malignant disease, thyroiditis and the rare types of thyroid enlargement, unencapsulated goitres are amenable to non-surgical methods of treatment. Of course, any non-surgical condition may through some unusual circumstances become surgical, and if a thyroid mass causes pressure symptoms through being intrathoracically located, or if it is located at the base of the tongue, surgery is indicated, irrespective of the type of growth. But these are the exceptions which prove the rule; we are here discussing goitres located in the usual position above the thorax.

Nearly every goitre encountered in medicine is preventable, for even in the most advanced case of encapsulated or surgical goitre there was a time when the growth was in its incipiency and unencapsulated, demanding but not receiving appropriate prophylactic measures.

How to recognize or differentiate non-surgical from surgical goitre we cannot discuss in this brief discourse. Generally speaking, the history of the case, the experience of the examiner in the careful use of his senses, including inspection, palpation and auscultation of the goitre, and the use of laboratory tests in doubtful cases, will yield the necessary information and decide whether surgical or non-surgical treatment is required.

Endemic Versus Sporadic Goitre.—Not only is exophthalmic goitre never endemic, but it is less common in endemic districts than elsewhere. On the other hand, toxic adenomata are more common in endemic districts because they depend for their existence upon preëxisting simple adenomata.

Though incapable of differentiation pathologically and clinically, endemic and sporadic goitres differ in etiology and therapeutic implications. Endemic goitre is due to lack of iodine in air, food, or water. The etiology of sporadic goitre is complex. Hereditary influences, acute and chronic infectious diseases, focal infections, puberty, adolescence, pregnancy, lactation and the menopause, diseases of the female reproductive organs, excessive physical and mental strain, faulty diet and hygiene, and other less known or unknown causes are responsible for sporadic simple goitre.

The Question of Iodine in Simple Goitre.—It can thus be seen that the question of endemic versus sporadic goitre is really the question of iodine therapy. The prophylaxis and treatment of endemic goitre is based upon the theory that there is a lack of iodine in the thyroid gland, due to a deficiency of this element in the district in question. When the iodine content of the thyroid reaches to or falls below 0.1 per cent, goitre develops. Accordingly, it has been found that the administration of the proper quantity of iodine in some form to the growing child or adult residing in these districts is successful in the prevention and treatment of goitre in the majority of

cases. In general, this is true of endemic but not of sporadic simple goitre.

I have pointed out elsewhere[1] that in the prophylaxis of goitre not evidently caused by geographical conditions, iodine administration, contrary to the prevalent opinion, is far from routinely successful. Of the comparatively small percentage of these patients who are helped by iodine therapy, it may be assumed that their habits of life, especially dietary habits, are such as approximate in effects upon the body those conditions peculiar to geographical deficiencies. A few individuals may be so constructed as to require a greater quantity of iodine for the performance of the bodily functions than all the rest of humanity, and for that reason develop thyroid enlargement in the presence of an intake of what would ordinarily be considered a normal quantity of iodine. These individuals, though not living in endemic goitre districts, present scattered cases of pseudo-endemic goitre, the prevention and treatment of which should be based upon iodine therapy. But, to repeat, the percentage of such cases in non-goitrous districts—*i.e.*, among great numbers of sporadic simple goitre—is not as great as it is generally thought to be. The prophylaxis or treatment of simple sporadic goitre routinely through iodine administration yields an occasional success with a large percentage of failures, and in not an inconsiderable percentage of instances evident harm is wrought.

On the other hand, not all cases of hypertrophic thyroid or colloid goitre occurring in endemic regions are endemic goitres. Indeed, judging from the numerous reports of harm wrought by iodine therapy of goitre in these sections, it would seem that a considerable percentage seen in Switzerland, France, and in our own country about the Great Lakes and in the northwestern States are due to causes enumerated under sporadic goitre, and as such are not generally amenable to but often aggravated by the administration of iodine.

Prophylaxis and Treatment of Sporadic Simple Goitre.—We may safely accept the generalization that in sporadic simple goitre the etiology is one operating on a basis of *excesive demands for thyroid hormone away from the thyroid; the organ, incapable of supplying this excess, must enlarge in efforts at physiological adjustment.* This process may be acute, chronic, recurrent, or intercurrent. Thus the thyroid, forced to become swollen, may not resume its normal size after the disappearance of the cause, but may continue to grow into definite goitre formation. During a period of weeks, months or years the mass is an unencapsulated hypertrophy or colloid goitre amenable to non-surgical management. The reasons for *failure* of cure by non-operative means are (1) treatment instituted too late, *i.e.*, the mass having become adenomatous or cystic, therefore encapsulated, requiring surgery; (2) lack of coöperation in treatment on the part of the patient; (3) inexperience of the internist in the therapeusis of this condition; (4) an attitude of impatience on the part of patient, physician, or both. Among other requirements, perseverance in the therapeutic efforts during a period of from six to eighteen months is vital. I find that the average case of simple hypertrophy or colloid goitre recovers completely and permanently with from six to ten months of cooperative effort.

In the ideal prevention of sporadic simple goitre, since heredity is a strong factor, prophylaxis must begin before birth of the individual. The pregnant mother who is susceptible to or already has goitre must be under supervision with regard to the necessary equilibrium of the endocrine functions. This is accomplished through ample physical and mental rest, the proper dietary and personal hygiene, and the guarded administration of thyroid extract. Incidentally, thyroid opotherapy will materially reduce the possibility of eclampsia.

The child born of goitrous parents must not necessarily become goitrous, though

[1]Bram (I.): Prevention of Sporadic Simple Goitre. Internat. Clin. (Phila.), 1922, 2 (Series 32), 108-113.

without prolonged medical supervision the chances to become afflicted with goitre in later years are great. The growing child should be guarded against excessive physical and mental stress and strain incident to school life. Puberty and the onset of the menstrual function constitute a pro-

Fig. 1.—Simple hypertrophy in a girl of 15. Duration of goitre, two years. Circumference of neck 13½ inches.

longed period of anxiety and peril. At this time too much care cannot be given the individual with goitrous parents, for if thyroid enlargement has been avoided heretofore, the crucial test is reached, and the organ may become swollen as an incident to the first menstruation, or a year or two before that time, followed by definite goitre formation. The girl must have explained to her the nature of the menstrual phenomenon, and she must be instructed in its hygiene. Physical and mental duties must be reduced to a minimum, and whenever possible she should stay in bed during the active period of menstruation. *This precaution taken monthly will do more than anything else in the prevention of sporadic simple goitre.* To state it more plainly, *the continuation of the usual physical and mental duties during menstruation in young girls is productive of a large percentage of sporadic simple goitres* seen in our midst.

Later, the marital relations, pregnancy, lactation, and the menopause, occurring in persons with an inherited tendency toward goitre, likewise require dietetic and hygienic supervision, with or without thyroid opotherapy, in the interests of prophylaxis.

With regard to the prophylaxis of goitre resulting from the infections, little if anything can be said. Usually the patient presents herself for the treatment of an already well-developed thyroid enlargement of varying duration; sometimes the goitre has existed for years, and the medical attendant, searching for etiological factors, discovers it to be of probable infectious origin either in the nature of a previous attack of an acute infectious disease, a coexisting pyorrhea, tonsillitis, sinusitis, salpingitis, appendicitis, and the like Rarely, if ever, are we called up to *prevent* goitre originating from this

Fig. 2.—Same patient as in Fig. 1, after eight months of treatment. Complete recovery of the thyroid to normal with reduction in neck circumference by 1¼ inches.

source—it is its *cure* that claims our attention.

Having discussed prophylaxis, let us give our attention to the treatment of an actual case. Infectious foci, dietetic, hygienic and other etiological factors must be sought for and corrected. In consideration of a drug, we must repeat that while iodine, not thy-

roid extract, may be employed with advantage in the management of endemic simple goitre, thyroid extract, not iodine, serves the purpose in the sporadic type of the disease. To reverse the rule *(i.e.*, to employ thyroid extract in endemic and iodine in sporadic goitre) may benefit a small percentage of patients, but in a greater per-

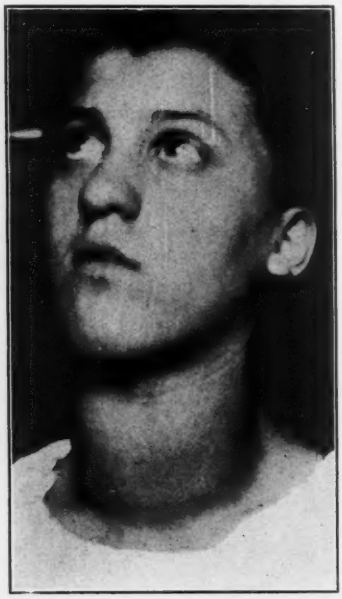

FIG. 3.—Marked colloid goitre, with beginning hyperthyroidism, of eight years' duration, in a girl of 15. Circumference of neck 16½ inches.

centage no change in the goitre will result, and in many instances the patient will become either generally indisposed, experience an increase in the size of the thyroid, or both. Though iodine is an essential ingredient of all potent thyroid products, and though Kendall's thyroxin, the most potent of thyroid substances, seems to depend upon its 60-per-cent iodine content, it is *iodine in its thyroid environment, or thyroid in its iodine environment,* that is required when the thyroid apparatus is to be relieved of its surplus burden of function.*

*Kendall's thyroxin, though the most potent thyroid derivative yet discovered, is not the last word in thyroid hormones. Thyroid substance still contains one or more undiscovered elements; this is suggested by the fact that thyroid extract is far more successful in the treatment of conditions requiring thyroid opotherapy than is thyroxin.

Thyroid minus iodine is impotent; with iodine it is thyroid as we know it—a substance at once a blessing and a curse in therapeutics and in sporadic goitre, depending upon whether it is used or abused. There is a "something" in thyroid substance which is more or less specific in the prophylaxis and treatment of sporadic simple goitre. The nature of this "something" is still a mystery, but its action is unique and incomparable to anything else known in medicine.

Electricity is at best an adjuvant in treatment, never a mainstay. Since simple hypertrophy and colloid goitre are evidences of need for thyroid hormone, *x*-ray treatments, calculated to hinder glandular function, may lead to myxedema, and are therefore distinctly contraindicated. On the

FIG. 4.—Same patient as in Fig. 3, after six months of treatment. Circumference of neck reduced by nearly 4 inches, with complete restoration of structure and function of the thyroid to normal.

other hand, it is not difficult, with a stimulating dose of *x*-rays, to cause a reversal of thyroid function with hyperthyroidism. I find that in cases in which the use of electricity is desirable, the static wave current alternating with galvanism is useful.

Puberty Hyperplasia.—In the consideration of simple hypertrophy and colloid goitre, we were dealing with the two non-toxic forms of thyroid enlargement amenable to non-operative measures. Puberty hyperplasia and exophthalmic goitre are the two toxic forms of non-surgical goitre. Strictly speaking, the former is potentially

FIG. 5.—Puberty hyperplasia of uncertain duration in a young man of 18. Circumference of neck 15 3/8 inches; weight of patient 122 pounds.

but not actually a form of toxic goitre. In other words, patients with puberty hyperplasia possess a basic susceptibility to Graves's disease. So far as I have been able to determine in a large series of these subjects, the earmarks characterizing a young adult with typical puberty hyperplasia are the following: (1) Heightened cerebration; (2) emotional instability; (3) excitable heart and labile pulse; (4) a moderate degree of vasomotor ataxia; (5) eyes brilliant or sparkling on attention; and (6) an unusually palpable thyroid gland which is often enlarged to definite goitre formation. This mass is soft and of symmetrical contour, occasionally presenting a systolic bruit.

Though in simple goitre the sex incidence is 5 or 6 females to 1 male, in puberty hyperplasia it is approximately 3 to 1.

Given a subject of the type above described, place him in an automobile going at the rate of 40 miles an hour, and rush the machine across railroad tracks just in time to avert a collision with an approaching train, and the mechanism of Graves's disease is begun. There need not be an accident. Psychic trauma, with or without physical injury, is the most usual history obtainable as the starting-point of Graves's disease. Following an earthquake, or in a fire in a large factory in which many are employed, a massacre, the wreck of a liner in mid-ocean, harrowing experiences on the firing line in battle, or in other situations of imminent danger to life, forty-nine out of

FIG. 6.—Same patient as in Fig. 5, after six months of treatment. Reduction in circumference of neck by ¾ of an inch with disappearance of goitre and a gain of 20½ pounds in weight.

fifty persons soon recover physical and mental poise and are themselves again. One of them, however, because of the singular susceptibility, may evince no psychic and endocrine recoil or adjustment to the previous neuro-endocrine balance. The trembling, the staring eyes, cold, clammy skin, the heart hurry, and other features express-

ing fright, remain, become chronic or "frozen," and we are confronted with a case of Graves's disease.

Treatment of Puberty Hyperplasia.—Treatment of puberty hyperplasia consists primarily of prophylaxis against the onset of exophthalmic goitre, and secondarily an endeavor by rational measures to reduce the thyroid to normal structure and function. Here also iodine is of questionable service in treatment, and *thyroid extract is distinctly contraindicated* as it may lead to exophthalmic goitre, by serving as an exciting cause of the disease. As this type of patient requires quite a few pages[2] for discussion, we can only make the following remarks: Treatment should be attempted along the same lines as applied to the management of exophthalmic goitre. Because of the physical and mental make-up of the patient, an individual standard of conduct to self and the outside world must be formulated for the subject. It is a twofold task—each contributing equally to the achievement of the goal, viz: (*a*) the adjustment or adaptation of the circumstances of life to the singular peculiarities of the individual, and (*b*) the modification and adaptation of the peculiarities of the individual to the circumstances of life. This applies to diet, hygiene, rest, exercise, vocation, avocation, sexual and sociological life, and in fact to nearly all the physical and mental activities of the individual.

EXOPHTHALMIC GOITRE (GRAVES'S OR BASEDOW'S DISEASE).

Though on the offensive with respect to operative mortality and *immediate* clinical results in Graves's disease, surgery is still more than ever on the defensive with respect to justification of operative procedures and the completeness and permanency of recovery. It is the contention between the various schools of treatment and the scarcity of clinicians who understand the disease and its victim that render the treatment of such a patient an almost unmanageable task; when, in truth, the prognosis in the usual instance of Graves's disease should be far better than that of the usual instance of pulmonary tuberculosis—and recovery should be far more conclusive.

In this paper we are not concerned with toxic adenoma or hyperthyroidism, which indicates a state of thyroid hyperactivity superimposed upon an old-standing nontoxic goitre, and in which thyroidectomy, removing the causal adenoma, cures the patient. We shall here discuss exophthalmic goitre or Graves's disease, an affection of wide-spread etiological, clinical and therapeutic implications.

Let us here correct a few erroneous conceptions regarding this syndrome, a disease concerning which there is now more discussion than ever before in the history of medicine.

1. Exophthalmic goitre is not primarily a disease of the thyroid gland. It may be defined as a *dysfunction of the endocrine organs and of the vegetative nervous system, characterized by increased catabolism, afebrile heart hurry, tremor, dermographia, emotional disturbances, weakness, loss of weight, a relative immunity to cinchonism, and usually also by exophthalmos and hyperplastic swelling of the thyroid.*

2. From this definition it can be seen that exophthalmos and goitre are inconstant and are not to be depended upon in diagnosis. It must therefore be concluded that the term exophthalmic goitre leads to error and misconception in diagnosis and treatment, and should not be employed as a synonym for Graves's disease.

3. If Graves's disease is not a disease of the thyroid gland, it is therefore not due to hyperthyroidism. The victim of this disease is a sufferer from a constitutional affection; he is no more a case of goitre than is a sufferer from typhoid fever a case of splenomegaly.

4. As a corollary to the above, any effort to effect recovery from Graves's disease by surgery applied to the thyroid gland is absurd therapy. The high mortality rate and unsatisfactory clinical results attest the irrationality of thyroidectomy, a procedure which attacks the wrong end of the disease.

[2]Bram (I.): The Prevention of Exophthalmic Goitre. *Endocrinology* (Los Angeles), 1923, 7 (No. 3), 415-430.

Of course, the surgeon may be of service in the removal of infected teeth, diseased tonsils, appendix, gall-bladder, and other infectious foci which may be encountered in these patients. Indeed, as in simple goitre, he may be called upon to perform a thyroidectomy if the thyroid substance is situated at the base of the tongue or intrathoracically. But in the usual run of cases to perform thyroidectomy in Graves's disease is at best to effect temporary improvement and a neat scar for the risk undergone. The low operative mortality rate in perfectly appointed clinics is *surgically* fortunate; *clinically* it is unfortunate, in that its coercive influence causes hopeful patients and many hopeful busy practitioners to put a blind faith in the knife as a remedial measure for this disease. Improvement in surgical technique and lowering of operative mortality rate are not *per se* good reasons for operating. The rationale of thyroidectomy should not be based upon the fact that only two or three in a hundred die of the operation. It is not justified even if many patients surviving operation are improved, if this amelioration of symptoms is incomplete and temporary. The patient rightfully expects but one result for the risk undergone and the resulting scar, and that is an unequivocal *cure*—a complete, permanent, subjective and objective restoration to health, happiness, and utility. Surgery does not produce this result in exophthalmic goitre. Moreover, the mortality rate, were a broadcast average taken, is still genuinely high. Thyroidectomy of the hyperplastic thyroid is replete with peril, and is one of the most difficult and dangerous of surgical procedures, the average mortality rate of which is considerably in excess of 10 per cent. I find that in clinics where thyroid work is merely incidental to general surgery, a 50-per-cent mortality in Graves's disease is occasionally met with. Even in preliminary ligations death occurs where it is least expected. If it is true that a patient dead is 100 per cent dead, we begin to dread lest in the very next patient scheduled for thyroidectomy something goes wrong.

If, as Crile[3] states, the thyroid is synonymous with making life worth living, then surgical removal of five-sixths of the organ* deprives the patient of five-sixths of that which is responsible for making life worth living. The claim that the patient can get along with one-fifth or one-sixth of the thyroid tissue originally given him by nature is fallacious. Though this may appear to be true during sleep and during moments of wakefulness akin to sleep, when body and mind are at a low ebb of activity, and are, so to speak, hibernating, a normally active individual requires all his thyroid structure and function in order successfully to compete physically and mentally with his fellow men. If we were endowed with a kind of supernatural vision, we should see the thyroid serving as a physiological barometer, indicating every physical and mental stress and strain essential to the onward march of civilization. Not only are patients with lessened thyroid substance unequal to normal physical and mental demands, but since this organ plays an important rôle in the immunizing processes of the body, a person possessing but a fraction of his thyroid is especially prone to infection.

TREATMENT OF GRAVES'S DISEASE.

Now what are the principles of nonsurgical management of Graves's disease? There is no specific etiology nor symptomatology characterizing the affection. Indeed, the chief characteristic of Graves's disease is its variability. All cases differ markedly, and though the four cardinal symptoms command our respect, they must not as a group be taken too seriously in a given patient. Thus we may note an absence of exophthalmos[4] and of goitre; we may note a varying combination of hyper-

[3]Crile (G. W.): Abst. *Jour. A. M. A.*, 1919, 73, 1633.

*The claim that a hyperplastic thyroid can afford to dispense with the greater part of its substance is an error, as the hyperplasia is an ally, not an enemy; it is nature's defensive reaction against toxins originating elsewhere in the economy. Graves's disease occurs first, the thyroid swelling follows as a result; moreover, rational therapeusis of the disease, *without any local therapeutic measures applied to the neck*, results in complete restoration of the hyperplastic thyroid to normal.

[4]Bram (I.): Exophthalmos in Exophthalmic Goiter; a Study of 400 Cases. *Am. Jour. Ophthalmol.* (Chgo.), 1922, vol. 5, no. 8, 609-622.

thyroidism and hypothyroidism; a varying combination of sympatheticotonia and vagotonia; in one patient there may be emphatic evidences of adrenal, in another gonadal, in still another pituitary, and again pancreatic or parathyroid involvement. One patient is still tolerably sane and sensible; another wavers, is obsessed with fixed ideas, or suffers from hallucinations and delusions, is a nymphomaniac, or is about to merge into a major psychosis. We might continue for hours to enumerate variations in the clinical picture of Graves's disease, bearing more or less on the nature of treatment to be adopted in an individual case. Any treatment, to succeed, must coincide with individual cause, individual symptoms, and individual peculiarities and idiosyncrasies. Hence it is that the management of such a patient is one of the most difficult tasks in medicine. Hence it is that such a patient is often a burden to the general practitioner and a source of worriment even to the surgeon.

Individualism, then, is the basis upon which the therapeusis of the disease depends. The following are a few brief generalizations in treatment:

Elimination of Discoverable Etiological Factors.—The mental and physical causes in each case must be ferreted out and removed, occasionally with the aid of relatives or friends, even if it requires hours of history taking; and a most painstaking physical examination, including the necessary laboratory analyses, should be made.

Rest.—Unless there is a serious heart lesion, the rest cure, so-called, is contraindicated in the average patient, as it rests neither mind nor body. A prolonged rest in bed makes for introspection, increases apprehensiveness, diminishes appetite, and reduces weight. The usual early or moderately advanced case does best on an eight or nine hours' sleep at night and a two hours' rest in bed after luncheon. The remaining hours are to be spent in any manner best suited to the individual case.

Diet.—The diet in general must be of nonflesh quality, but of very ample, I should say overample, quantity, free from irritants and stimulants. Food must be taken in specified quantities at stated intervals. Nausea, vomiting, indigestion, constipation, diarrhea, and glycosuria—each must be carefully managed with one point in view, that of increasing the food intake and the weight of the patient. It is my habit to give each patient or medical attendant a diet list stating in detail the quality, quantity, and the time of taking food constituting the daily dietary requirements.

Drugs.—It is in the consideration of drugs that the greatest degree of individualization is required. Here, indeed, "what is one man's meat is another man's poison." In each patient a drug or drugs may be found to yield favorable results, but no drug, not even quinine, may be regarded as a specific in all cases. Also, in no other disease is it so vital to know what *not* to give. Such substances as corpus luteum, suprarenal cortex, posterior pituitary, pancreatic extract, and parathyroid, singly or in combination, are useful. Thyroid should never be employed except when symptoms of hypothyroidism dominate the scene, and even then it should be given very cautiously. The iodides, mercury, belladonna, ergot, veronal, luminal, ichthyol (internally), iron, arsenic—all have their field of usefulness. Bromides and the opiates are not to be resorted to. Sparteine sulphate may be employed, but digitalis, excepting in convalescence, is harmful in this disease. There are other drugs that might be employed in the presence of unusual indications, but care must be taken with regard to individual idiosyncrasy and susceptibility.

Electrotherapy. — Electricity (and the same might be said of drugs) should never be regarded as a mainstay. Occasionally it may be employed for psychical effect. The only forms of electricity that may be regarded as useful supplements in treatment in a small percentage of cases are the static wave current over the thyroid gland and the Roentgen rays. The *x*-ray, in common with surgery, has for its purpose the reduction in quantity of functionating thyroid, and at its best succeeds, as does surgery, temporarily in alleviating evidences of hy-

perthyroidism.* Occasionally, for some mysterious reason, it renders the syndrome of Graves's disease more acute, and rarely causes death. Not infrequently overdosing occurs, resulting (as is the case in the removal of too much thyroid by surgery) in myxedema. As a supplement to other nonsurgical measures, *x*-ray treatment may be

FIG. 7.—Exophthalmic goitre of advanced type of about five years' duration in a woman of 45. Extreme myocardial weakness with daily attacks of severe angina and a heart rate of 150. Weight 122¾ pounds. Marked weakness, exophthalmos, pulsating goitre, extreme nervousness, tremulousness, insomnia, with the patient verging on a major psychosis. She had been confined to the house as an invalid for many months.

employed advantageously in patients where the thyroid hyperplasia is unusually great, but it must be borne in mind that underdosing, rather than sufficient dosing, is the safest. In general, I find it almost unnecessary to resort to measures of this sort, and in at least ninety per cent of my patients no local therapeutic measures directed to the thyroid are employed.

*We are still in doubt as to whether the thyroid is in a state of hyperthyroidism or of dysthyroidism in Graves's disease. Whatever the nature of the disturbed function, this constitutes but a link in the chain of clinical events presented by this affection. Though in thyroid toxic adenoma hyperthyroidism is responsible for the symptomatology, this cannot be said of Graves's disease. Hence, though *x*-ray treatments may serve in a percentage of cases to curtail the evidences of thyroid malfunction in Graves's disease, this does not constitute a rational means of effecting recovery, and at best produces but apparent, partial, and temporary amelioration in the subjective symptomatology of the disease.

Psychotherapy.—If I were asked what I consider the most important element in the management of a patient suffering with Graves's disease, I would say psychotherapy, because first, in this disease there is an inherent mental instability requiring a painstaking adjustment without which all other measures are futile, and secondly, psychotherapy, aiming as it does at sincere coöperation, is responsible for the adjustment of the patient to his environment† and the measures in treatment employed in the attainment of the goal.

With regard to the duration of treatment no fixed rule can be formulated. In the average case of Graves's disease marked subjective improvement is experienced within a few weeks. Complete recovery

FIG. 8.—Same patient as in Fig. 7, after twelve months of treatment. Restoration of the heart to normal with a rate of 70 per minute; gain of 40 pounds in weight. Complete subjective and objective recovery of patient to normal. The patient is experiencing unprecedented good health.

usually occurs within twelve months, at which time the patient is discharged from active treatment. He is now placed upon a period of passive observation—*i.e.*, reporting for examination at intervals of two or three months during the ensuing year to

†In this connection it is frequently necessary to interview the patient's relatives and friends in the interests of coöperative effort.

confirm recovery, following which he is permanently discharged. In patients who have in this manner been formally discharged from treatment, I have not had a single instance of relapse.

PREREQUISITES TO RECOVERY.

In conclusion, I would state that there are four conditions which must obtain if we would achieve our goal: (1) The patient must still have a reasonable amount of recuperative power. (2) The patient must be tolerably sane. (3) The patient must be sincerely coöperative. (4) The medical attendant must be properly equipped as a diagnostician, therapist, and psychologist, in order properly to manage his patient. In brief, the properly equipped internist, after eliminating those who are moribund, the insane, and the non-coöperative, should obtain approximately one hundred per cent of recoveries.

A Study in Differential Diagnosis, or a Suggestion as to How to Avoid Unnecessary Operations[1]

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Ever since my interneship the problem of how to avoid unnecessary operations has interested me. At one and the same time I had under my care at the Cook County Hospital three women who had been ovariectomized by three of Chicago's most prominent gynecologists of that day; none of them had been relieved of the trouble for which they sought relief, and all three were nervous wrecks. I vowed then and there that I never would remove a normal ovary from a woman, and never all ovarian tissue if it could possibly be avoided. This resolution I have kept, with the result that I have none of this type of nervous wrecks on my conscience. There are however other types of cases in which practically all surgeons who do much operating have erred at times. I refer to what is commonly spoken of as the nervous patient. I presume every surgeon who has done many operations has occasionally unwisely and unnecessarily operated upon one of these patients. The older surgeons in time by repeated failures and disappointments gradually almost intuitively recognize these patients and thus avoid too frequent repetition of this error, but what about each succeeding generation of surgeons? Must they continue by hard practical experience, unnecessary operations and failures to injure both their own reputation and the good repute of the whole surgical profession? It is with the hope of shedding some light upon this vexed problem and substituting definite known facts based upon clinical experience for surmise, conjecture, and an indefinite feeling that this paper is presented.

For the past thirty years I have made a continuous, at times a very intensive, study of a definite disease condition and symptom-complex which I have described under the name of chronic fatigue intoxication, a pleomorph disease which if thoroughly understood will, I believe, give us the basis for a clearer understanding of some of these problems.

Chronic fatigue intoxication is a general, chronic, organic, systemic disorder, the result of the gradual accumulation in the tissues of excessive amounts of fatigue material. It manifests itself symptomatically in a deviation from the normal of practically every function of the body, in that reaction is out of proportion to the stimulus acting, by more or less generalized tonic muscular spasm, by an inability on the part

[1]Read before Southern Surgical Association at White Sulphur Springs, West Virginia.

of the affected individual to secure complete physical relaxation or mental repose, and by a very characteristic group of physical signs and symptoms, a few of the more important ones of which I will here enumerate. This disease manifests itself in two quite distinct stages, the acute and the chronic, the symptoms of which are quite different, though gradually merging into each other. The skin symptoms may be either extreme dryness with fissuring of the skin, or extreme oiliness as represented by seborrhea oleosa. Dermagraphia, urticaria, angioneurotic edema and pruritus are often met with. Herpes labialis is a frequent symptom of the acute condition and herpes zoster of the chronic. One of the most common symptoms is a discoloration of the skin, sometimes with block pigment, and again simulating true icterus. Thickening of the skin, often associated with a diffuse hard infiltration of the subcutaneous areolar tissue, is met in all severe cases. Pea-to-filbert-sized deposits at the origin and insertion of the skeletal muscles and the deep fascia are also often present. The tonicity of the muscles can easily be demonstrated by careful examination of the various muscles and manifests itself in the severe cases by very characteristic facial expression. The most common gastrointestinal symptoms are dryness of the gullet, hyperchlorhydria, gastralgia, eructation of gas, constipation or alternate constipation, and looseness of the bowels. The joint symptoms are pain, stiffness and thickening of the extra-articular structures. Neuralgia is one of the most common symptoms of the disease, and may involve almost any sensory nerve of the body.

The signs and symptoms of chronic fatigue intoxication are if anything more numerous and more varied than those of lues even; as a consequence it is at times necessary to differentiate this affection from almost every other disease. The surgeon, however, will find his greatest difficulty in differentiating it from three types of conditions: 1st, gall-bladder disease; 2d, the different types of neuritis; and finally 3d, the various types of chronic arthritis.

Differential Diagnosis Between Chronic Fatigue Intoxication and Gall-bladder Disease.—Quite a number of the chronic fatigue intoxication patients have a very tender, painful deposit at the tendinous insertion of the rectus abdominis on the tip of the right seventh costal cartilage, which has misled many an abdominal surgeon into the belief that such a patient is actually suffering from gall-stones; however, on careful examination it can be ascertained that this point of tenderness is caused by an exquisitely tender split-pea-sized deposit which can actually be felt to move under the examining finger, which can be removed by a few properly given massage treatments, when this pseudo-gall-stone symptom will promptly disappear. An additional point in helping to make the diagnosis is the fact that in almost every such case a corresponding similar deposit is located over the tip of the seventh costal cartilage of the left side, and often other similar deposits at the other points of insertion of the rectus abdominis on the tips of the fifth and sixth cartilages on both sides and also on the ensiform.

One point, however, which is confusing and may easily mislead, is the fact that in this condition, as well as in gall-stones or other forms of gall-bladder disease, the right rectus is usually very tense. However, if gall-bladder disease does not coexist, and if one will be careful in making the examination not to traumatize the little tender deposits on the tips of the fifth, sixth and seventh cartilages, one can usually make pressure under the costal arch, get the muscle to relax fairly well, and then discover that there is no tenderness over the gall-bladder itself. If, on the other hand, gall-bladder disease coexists with this condition, the gall-bladder also is likely to be tender and the rectus muscle will not relax at all.

The differential diagnosis between gall-bladder disease and this condition is sometimes further complicated by the fact that

quite a large percentage of the more severe cases of chronic fatigue intoxication actually present a distinct subicteric condition of the sclera and the skin closely simulating true jaundice. Quite a number of cases have come to my attention in which an abdominal section had previously been made with the expectation of finding gall-stones or other gall-bladder disease, where no stones were found and where drainage or even cholecystectomy gave no relief either from the pain, digestive disturbance, or discoloration of the sclera and skin; where I was able to demonstrate a sufficient number of the unmistakable signs to make a positive diagnosis of this condition, and where I was actually able by suitable treatment to secure a complete cure without further operative intervention.

Differential Diagnosis Between Chronic Fatigue Intoxication and Neuritis.—Probably the most frequent difficulty in making a differential diagnosis is encountered in differentiating the various neuralgias so frequently a part of this disease from various other conditions. Thus, for instance, not long ago I saw a patient suffering from this condition, and a part of the general symptoms was a severe neuritis of the right small occipital nerve, which resulted in the faulty diagnosis of a right acute mastoiditis. On careful examination I was able to convince myself that the tenderness over the mastoid bone was simply a part of the general condition of chronic fatigue intoxication. Subsequent progress of the case proved the correctness of this conclusion. I have also seen quite a number of cases of trifacial neuralgia which were thought to be caused by defective teeth, in which neuralgia was simply a part of the general condition. In a number of these cases perfectly healthy teeth had been sacrificed without a particle of relief. One very severe case of supposed infection of the left antrum was also found to be simply a trifacial neuralgia due to this condition.

An intercostal neuralgia due to this condition is sometimes mistaken for a dry pleurisy. A deposit on the sensory nerve supplying the skin over McBurney's point has repeatedly been mistaken for appendicitis. I have seen a number of cases that had been operated upon for appendicitis in which the pain was not relieved, in which this deposit could actually be demonstrated, and in which the patient recovered completely under suitable treatment without further operation.

The idea that focal infection is the cause of the majority of cases of both simple and multiple neuritis whether it be acute or chronic has gained a strong foothold in the medical profession. My experience convinces me that not to exceed 30 per cent of all cases of neuritis are caused by focal infections, that fully 50 per cent are caused by chronic fatigue intoxication, and the remaining 20 per cent by a variety of causes, among the most prominent of which may be mentioned lues and malaria.

Differential Diagnosis Between Chronic Fatigue Intoxication and Chronic Arthritis.—While infection is unquestionably the cause of the largest percentage of arthritis, there is a rather obscure form of arthritis not at all uncommon and heretofore poorly understood which I am thoroughly convinced is caused by this condition. This arthritis may involve every movable joint of the body, is insidious and gradual in its development, sometimes remaining stationary for months only to flare up again, and may take years before fully developed. Some fifteen years ago I saw such a patient with beginning joint involvement who saw fit not to take my advice, went to a number of physicians, finally drifted into the hands of Christian Scientists, back again to regular practitioners, and when I saw her ten years later she was absolutely helpless, completely bedridden, and finally died from this affection.

The joints involved are usually irregularly enlarged, often the swelling is in lumps, and this peculiarity is quite characteristic. Later in the disease the swelling may be more diffuse, but on careful inquiry it is usually possible to elicit the information that the swelling began at one

point and remained localized for a considerable time before becoming general. At the time of examination the swellings may or may not be tender or painful, but on the occasion of acute exacerbations which occur from time to time, they puff up, feel hot to the touch, become reddened and more tender and painful. As the disease progresses motion becomes more and more interfered with. The stiffness is not due to a true ankylosis, for, except in the terminal cases, extension and flexion can be accomplished almost or quite to the normal extent by gentle, slow, passive motion. The involvement seems to be confined entirely to the periarticular structures, namely, tendons, ligaments, and capsule.

I have never come across a case, and I have examined dozens of them, in which either the bone or the cartilage was involved in a pathological process so far as I was able to determine, and at no time have I found free fluid within the synovial sac. The degree of swelling is often very pronounced, and the swelling sometimes so firm that on a number of occasions patients have been very positive in their belief that the bone itself must be the seat of the trouble; but in these cases the *x*-ray showed no such involvement. The most typical and easily studied joints of this kind are the smaller joints, the type now generally called Heberden's nodes, which Heberden described under the heading "Digitorum Nodi." Heberden's description is so perfect and graphic that I insert it here:[1] "What are those little hard knobs, about the size of a small pea, which are frequently seen upon the fingers, particularly a little below the top, near the joint? They have no connection with the gout, being found in persons who never had it; they continue for life, and being hardly ever attended with pain, or disposed to become sores, are rather unsightly than inconvenient, though they must be some little hindrance to the free use of the finger." I have just this addition to make to the above description, namely, that under proper treatment these nodes do disappear, and that while they are being stirred up they are quite painful. The changes in the larger joints are identical with those found in the smaller ones, only on a larger scale, and the knobs are more often spread out, diffused.

The tonic spasm of the skeletal muscles associated with these joint involvements results in very decided limitation in motion. This stiffness of limb and joint, observed so frequently among persons who habitually do hard physical labor, is undoubtedly caused by this condition in the overwhelming majority of cases. In the milder cases this gives the patient a very characteristic walk, later puts a heavy burden on the will in every effort to move the joints, and in the severest cases the condition becomes so pronounced that voluntary motion becomes impossible and passive motion, because of long-continued non-use, very difficult and very painful. I could present many histories to substantiate the statement that chronic fatigue intoxication is frequently mistaken for a true surgical affection. However, I will confine myself to the giving of some comparative statistics and the essential points of only two cases, namely, first, the case of a professional man, fifty-one years of age, now under my care, who gave the following operative history:

1 at 33, tonsillectomy.
2 at 37, drainage of gall-bladder.
3 at 38, anal fistula.
4 at 46, subacromial bursitis.
5 at 47, tonsillectomy.
6 at 47, nasal spurs and deflected septum.
7 at 47, double inguinal herniotomies.

His principal symptoms were approximately the same eight weeks ago, when he first consulted me, as they had been for the previous eighteen years when he had his first tonsillectomy performed, namely, marked muscular weakness, severe muscle and joint pains, heretofore described as rheumatic and ascribed to focal infections and for the relief of which he had had most of the above enumerated operations, but

[1] Heberden, William: Commentaries on the History and Cure of Diseases, 1782, chapter 28, pp. 119-120.

which symptoms were, I believe, actually caused by the tender, painful deposits in the skin, periarticular structures, and tendons. Subicteric conditions of the skin and sclera still persisted fourteen years after the gall-bladder drainage.

The second was a woman forty-two years of age who came to me for examination on November 8, 1923, and from which I take the following operative history:

Appendectomy, left salpingectomy, and left oöphorectomy at 29; nine months later gastroenterostomy; at 32 cholecystectomy and uncoupling of gastroenterostomy; relief from none of the operations. Previous to the first operation she had frequent vomitings, and since operation has continued to vomit after each meal. Patient states that if she eats nine times a day she vomits nine times a day. Never epigastric pain and never nauseated. Appetite good, sleep good, bowels constipated. Best weight 137 pounds. When examined weight 90 pounds, tongue thickly coated, moderate spasm pectoralis major muscles, marked spasm trapezius and lumbar muscles. Vomitus excessively acid. Blood and urine examination negative. At the end of three weeks weight 100 pounds; has vomited only eight times during the past three weeks, against at least 60 times for the previous three weeks.

In an analysis of 50 case histories taken at random of 50 patients suffering from chronic fatigue intoxication, I find that 25 had had operations at some time during their life, 15 having had one operation each, 7 having had two operations each, 2 having had three operations each, and 1 having had four different operations; or a total of 39 operations to 50 cases. While in 50 case histories of 50 patients not suffering from chronic fatigue intoxication taken at random we find that only 12 had had operations, 9 having had one operation each, 2 two operations each, and 1 three operations; or a total of 16 operations.

I fully realize that this is not a large enough number to prove the case, but it is at least corroborative evidence.

Closed Drainage in Acute Empyema Thoracis[1]

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It is a well-recognized fact that the immediate or operating table mortality in acute empyema of the thorax is extremely high, in fact probably the highest of any of the usual major operations. I say major operation advisedly, for a thoracotomy with rib resection is a serious undertaking for the patient because of its immediate danger of sudden death and because of the probability of a postoperative chronic chest cavity. With the idea in mind of reducing the occurrence of both these complications, the writer has used the closed method of drainage and irrigation which is described in this article. No claim is made as to the originality of the closed method, for in some form or other it has been practiced for many years, first by Thiersch, I believe. The description in detail of a satisfactory method with the addition of a few refinements I think will be of advantage to some. The technique used in our series will be described minutely, for it has been my experience that unless every step is explained to the interne and the nurse, some slip will occur.

Patients with pus of an acute nature in their pleura are usually extremely ill, toxic, dyspneic, and with embarrassed vascular systems, due to the derangement of the mediastinal contents. It is the duty of the operator to take each and every one of

[1]Read before the West Branch of the Philadelphia County Medical Society.

these factors into consideration in the choosing of the easiest, the quickest and the least shocking means of, first, evacuating the pus without endangering life, and second, establishing a drainage that will minimize the possibility of a resulting chronic sinus and chest cavity with its partially collapsed lung and rigid pleura.

Rib resection is contraindicated in sick patients because it is a major operation and is attended by shock due to the fact that despite the best care there is sure to be a sudden and marked change in the intrathoracic pressure, with resultant shifting of the great vessels and the heart with more or less tug on the vagi. Following such an operation the patients are usually very dyspneic, sometimes orthopneic, have a pulse hurry, and are harassed by a constant cough and pain. They furthermore must be subjected to the constant disturbance of repeated dressings. These disadvantages are all escaped by the following plan:

The patient is placed in the semisitting position on the bed if necessary, or on the operating table, and is drawn over so that the affected side partially projects over the edge of the bed or table (Fig. 1). This is usually a position of comfort, and furthermore makes it much easier to find the pus at or near the puncture wound through which the medical man previously found it with his patient sitting up in bed. We all know how often the surgeon has had to make repeated insertions of an exploring needle before finding pus, and even failing altogether, where it was found the day before, simply due to the fact that he has the patient lying horizontally and turned upon the unaffected side, thus shifting the pus. Some one stands opposite and supports the patient's head and holds the arm of the affected side out of the operative field. The patient is further given a support for his feet.

Using ½-per-cent novocaine in a 5-cc Luer syringe and a fine hypodermic needle, the skin is infiltrated for one-half inch at the selected site for drainage. The needle is now changed for a longer one of 16 to 18 gauge, by means of which the intercostal tissues and nerves are infiltrated. After waiting a moment the needle is gently pressed against the pleura. Should this give pain more novocaine is instilled against the pleura. The needle is pushed through the pleura and the piston slowly withdrawn, followed by pus. The needle is left in position, and the skin is incised beside it for a quarter of an inch each side.

The special trocar and cannula, of which there are two sizes, one for adults and one for children (Fig. 2), is introduced immediately the needle is withdrawn, and slowly inserted until the point is directed between the ribs, with a slight upward slant to escape the diaphragm. Then with the

FIG. 1.—Shows the position of the patient, partially over the table edge, to allow the surgeon to work from behind. In this position the patient in no way has breathing obstructed by reason of pressure on his normal side.

index-finger guarding against undue depth, the instrument is quickly jabbed through the pleura (Fig. 1). The trocar is now withdrawn and a long rubber tube previously marked and fenestrated (and accurately fitted to the cannula) is fed through the cannula into the chest as the pus is flowing. The cannula is withdrawn and the

flow of pus now stopped with a clamp. In this manner no air can enter the pleura.

The fenestræ, two or three in number, should be within 5 cm. of the end of the tube, and the markings, which may be slight nicks with the scissors on the tube, so spaced that with the fenestrated end in

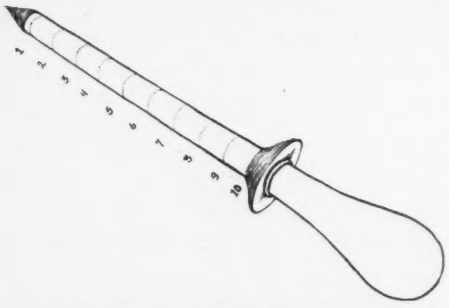

Fig. 2.—The trocar and cannula has a short rounded point to prevent cutting. The shoulder of the beveled point should correspond to the smooth end of the cannula. The larger instrument has a diameter of 11 mm.

the chest you can determine accurately how much tube is within the pleura, the thickness of the chest wall being known by reason of the depth at which the needle found pus. It is extremely important that the fenestræ all be within the pleura, for if one opening lies in the intercostal tissues, pus will leak through and give a cellulitis of the chest wall. Four to six centimeters of tubing within the pleura is sufficient.

A silk thread is now tied snugly around the tube at the skin level and a large safety-pin threaded through it, not however penetrating the tubing, as to do so would tend to block the flow of thick pus. The pin is strapped to the chest wall and the patient returned to bed, where the irrigation suction apparatus is installed (Fig. 3).

The nurse is instructed to keep the foot of the tube always submerged except when she empties the receptacle, before doing which she should place a clamp on the chest tube (Fig. 3, Y).

The clamp is removed at stated intervals, one to two hours, and from 4 to 6 ounces of pus allowed to flow, two-thirds of which amount is replaced by Dakin's solution and the clamp replaced. Should the flow cause cough or pain it is stopped momentarily and then continued. When the pus is all drained out, in twenty-four hours, the clamp is left off and a continuous gravity drain continued.

The reservoir is at first filled with Dakin's solution from an 18-inch elevation, and 75 to 100 cc is then allowed to run into the pleura by clamping Z and unclamping X. Should this cause no cough or choking, we consider that there is no bronchial fistula and continue Dakin's solution irrigations. The nurse is then instructed to allow a given quantity, 75 to 100 cc, to flow into the chest every two hours, and by clamping Y allow it to remain there for five minutes. The Dakin solution serves the double purpose of an antiseptic and a cytolytic agent dissolving the thick pus and exudate, which will flow out in clumps.

Should the Dakin cease to flow in or flow in very slowly, suction with a Triumph syringe will dislodge the obstructing lymph. This treatment can be and should be continued throughout the twenty-four hours, as it does not disturb the patient's sleep. The

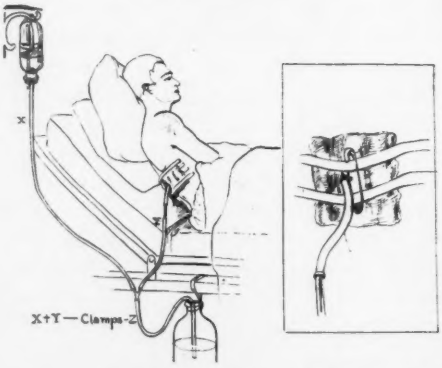

Fig. 3.—A graduated reservoir, elevated about 18 inches, connected in Y by tubing of uniform size with the pleura and a receptacle hung from the bed. X and Y and Z indicate the position of clamps. The lower tube must always have the open end submerged or clamped. The insert shows the method of attaching the tube to the chest wall.

amount of pus collected each twenty-four hours should be charted, and as it reduces the amount of Dakin used at each irrigation is reduced accordingly.

The patient can take any position he desires, and after the first three or four days can sit out of bed. The dressing need not be changed for several days, sometimes

not for two weeks, at which time the tube has begun to loosen and some solution leaks out around it. Should this leak occur earlier than ten days it means the tube is occluded within the chest or has slipped out far enough for one of the fenestræ to be outside the pleura. When the suction is no longer air-tight, the tube is cut close and the case treated as an open one for a few days, after which the tube is removed entirely.

This method has been used by the writer in a small series of 12 cases, all of which were too ill for rib resections, and in only one was any further surgery or drainage necessary, due to the fact that the tube was pulled out accidentally and the resident physician replaced it in the chest wall but not in the pleura.

Should a slip in technique occur and some air enter the pleura, it can be withdrawn simply by allowing the solution to run steadily from the reservoir into the receptacle, thus acting as a water pump to suck the air from the chest. The result shown in one case of pyopneumothorax demonstrated clearly what can be done in this respect. A series of *x*-ray pictures show further that the diaphragm maintains its normal dome shape and does not flatten out and approach the chest wall, tending to close off above the tube, as occurs in the open thoracotomy.

Advantages: The closed aspiration and suction drainage has been the method of choice.

It is a minor procedure, unattended by shock, pain, or discomfort. It is accomplished under local anesthesia with one pair of hands, and if necessary without moving the patient from bed. It does not cause cough, dyspnea, or any other symptoms referable to a sudden alteration in the relationship of the thoracic contents. It prevents pneumothorax and the common sequel of a chronic cavity with more or less lung collapse. It does not subject the patient to the danger of osteomyelitis of the severed rib ends. It means an economic saving in time and dressing materials. It leaves the chest in a more nearly normal condition and it shortens convalescence. It can be performed by any physician or internist.

This series of cases all recovered.

Insulin Hypoglycemia: Dangers and Precautions.

In an editorial on this subject the *Lancet* of November 10, 1923, states that the advantages of insulin in the treatment of diabetes mellitus are now well recognized; the dangers, although they have been described, are not so well recognized, partly because the treatment has been confined to comparatively few patients who have been under fairly close supervision. The most striking effect of an injection of insulin is the reduction which takes place in the amount of sugar in the blood. It has been shown that when the blood-sugar of a rabbit falls below 0.05 per cent the animal has a convulsion which may be of quite a short duration or which may kill the animal. This phenomenon has provided a useful basis for the standardization of insulin. The quantity of insulin which will depress the blood-sugar of a rabbit weighing about 2 kilos below 0.05 per cent in two hours is called three units. The exact cause of the convulsion is not known, but it is connected in some way with the amount of sugar in the blood since it can be checked in a few minutes by the subcutaneous injection of some grammes of dextrose. The rabbit then seems as well as ever, provided that the dose of insulin was not too big and enough sugar was given.

Similar remedial effects can be produced by injecting either adrenalin, which raises the blood-sugar, or pituitary extract. In human beings the symptoms of overdosage are various. They do not, as a rule, occur unless the blood-sugar is less than 0.05 per cent, although they may occur when the blood-sugar is still as high as 0.09 per cent. The commonest symptom complained of is a feeling of inertia or lassitude, sometimes accompanied by slight dizziness, about three or four hours after the injection. This is often accompanied by sweating and

abdominal pain, which is described as similar to a hunger pain. Tremor of the hands is often complained of and numbness of the hands, face, or tongue; diplopia may also be present. All these symptoms, although very unpleasant, do not put the patient in any danger of life. They may be relieved by giving at once a hot drink or some of the food which would have been eaten at the next meal. It is not necessary or desirable that patients should take sugar in order to relieve these symptoms. During the preliminary period of treatment in which the correct dose of insulin is being ascertained some slight symptoms are often unavoidable, but once the blood-sugar is normal and the size of the dose settled the patient should not experience any such symptoms.

The dangerous symptoms are: (1) a state of unconsciousness, and (2) convulsions of a peculiar kind. The unconscious state is very alarming, and although it usually occurs after some of the milder symptoms already described it may take place in their absence. Unconsciousness may develop while the patient is talking or eating (just as a person may fall asleep while doing these things), and the state is very similar to one of deep slumber, from which, however, the patient cannot be roused, the breathing, pulse, and color all being good. Although the rabbit has convulsions it was at one time thought that human beings did not suffer from them. The case described by Hinds Howel in the *Lancet* of November 3 is certain evidence of their occurrence. Moreover, in a pamphlet which has just been received through the Rockefeller Foundation, convulsions find a place between aphasia and collapse in a list of symptoms likely to follow an uncorrected overdose. Although the condition is so easily relieved by the giving of sugar, it is one which calls for a widespread knowledge of the symptoms and treatment. It is certain that a patient who is taking more than 15 or 20 units of insulin and going about his occupation would be well advised to carry four or six lumps of sugar in his pocket, either dry or dissolved in water, in order to be ready for emergencies. This precaution will, by the way, add to the temptations of the dieted patient. It would also be well if the patient would carry a card about in a pocket or round his or her neck stating that he or she suffers from diabetes, is taking insulin, and has some sugar in a pocket. This precaution is suggested by the prospect of a doctor being called to see a patient who is either unconscious or having convulsions. If he did not know that the patient was taking insulin it is extremely unlikely that he would diagnose the cause of the condition correctly. A dose of sugar, either four or six lumps, dry or in solution, should be ample to restore the patient, provided that he can swallow. If not, a subcutaneous injection of adrenalin, 1 in 1000, minims 15, will restore the patient to consciousness within about five minutes. Sugar should be given afterward in order to prevent any fear of relapse. If no adrenalin is at hand, pituitary extract, 1 cc, will also act very promptly. If neither of these is available, it will be necessary either to give the sugar by means of a stomach-tube or to inject about 20 g. of dextrose (5-per-cent solution) intravenously. In order to avoid the possibility of these dangerous symptoms arising the dose of insulin should always be moderate in size, and if larger doses than 20 units are being given, the patient should certainly take the precautions described.

The actual size of the dose which will be liable to cause dangerous symptoms will, of course, vary with the weight of the patient, the amount of sugar in the blood, and the amount of carbohydrate eaten after the insulin. When a patient has taken a large dose of insulin—say 30 units—and has eaten a definite amount of bread, he does run a certain risk in that the bread may not be absorbed, or, apparently after exercise, as in the patient whom Howell saw, may not be sufficient. One of the early causes of overdosage has fortunately been removed by the care with which insulin is now standardized.

Editorial

THE DIETETIC TREATMENT OF NEPHRITIS.

In a recent issue of the London *Practitioner*, Wallace Jones, one of the physicians to the Liverpool Royal Infirmary, uses words which we quote because they are eminently true. As readers of some of our previous editorials are probably aware, not only are these words true, but they are of infinite importance to the physician and his patient. He writes: "Our conceptions of the most suitable diet for nephritis have undergone considerable change, and we know that the restricted diet which played such an important part in the treatment of nearly all forms of nephritis in the past often imposed a great hardship on the patients and hindered their recovery."

It goes without saying that a nephritic of any type should not overindulge in food or drink, but the view which is still widespread that any variety of nephritis contraindicates the ingestion of animal food certainly does harm, and particularly is this the case in chronic parenchymatous nephritis so-called, with or without dropsy, but with a large amount of albumin in the urine.

Many years ago we took the position that where albuminuria was very profuse this represented a loss to the patient which should be compensated for by a certain amount of protein food, and within recent times Epstein and others have emphasized this point and have shown that by the use of such food the patient is given vigor and the course of his disease is not hastened but delayed. Oftentimes in the presence of dropsy such protein foodstuffs if administered will actually increase the urinary flow, presumably because the urea derived from such food acts as a diuretic.

To use Wallace Jones's expression, in the hydremic type of nephritis the effect of an increase in diet sometimes brings about a dramatic change in the condition of the patient, who often after being bedridden for months with ascites and edema, rapidly improves with disappearance of most of the symptoms.

The problem in the case of chronic contracted kidney is very different, since under these circumstances there is prone to be far more retention of nitrogenous products in the blood, but even here it is questionable as to whether it is wise to deprive the patient of all animal food as is frequently done. We are too prone to forget that the normal diet consists in a certain proportion of protein, fat, and starch, and that no less than about an ounce and a half of protein per day is needed by a man weighing 150 pounds to maintain nutritional equilibrium. It is at this point that the estimation of the non-protein nitrogen of the blood rises to its greatest importance. If the non-protein nitrogen blood content is under 25 milligrammes per cent, we see no reason why meat should be prohibited in a case of chronic interstitial nephritis, whereas the higher the non-protein nitrogen above the normal the more must we be cautious in using animal food.

In conclusion, therefore, the point that we wish to emphasize is to combat the general view that any nephritic, but particularly the one with much albumin in the urine, should be put upon a pure vegetable diet; and again we wish to emphasize the point that if the patient with parenchymatous nephritis is edematous, there is no reason for placing him upon a salt-free diet unless it can be shown that he has chloride retention. Here again it must not be forgotten that salt is in one sense as essential to the diet as any ordinary form of food. Taking it from the diet makes food insipid and deprives the body of a normal ingredient which is necessary for its existence. Of course, in those cases in which there is salt retention, the further use of chloride of sodium is not necessary or wise. In such a case the body has more salt than it needs because of its inability to eliminate through the kidneys the normal daily output.

THE INFLUENCE OF DRUGS UPON THE SIZE OF THE HEART.

Modern methods of investigation have rendered it possible to study this subject much more accurately than heretofore, and in the course of the next few years, partly by the aid of the electrocardiograph and partly with the assistance of the *x*-rays, a very considerable amount of information may be gained.

A few years ago medical literature was burdened with a good many papers in which appeared a discussion of the size of the heart as determined by percussion. The writer of this editorial has always had grave doubt as to the reliability of such observations. Manifestly when great enlargement due to hypertrophy and dilatation is present, "he who runs may read," but when some physical diagnostician asserted that by means of percussion, or other methods of physical diagnosis, he could determine comparatively minor enlargements, it seemed as if grave doubt could be cast upon the observation.

Recently several papers have been published concerning the use of *x*-ray in determining cardiac size, as, for example, that by Gordon and Strong, who used rabbits which were subjected to severe exercise. They found that under these circumstances the *x*-ray revealed a definite decrease in the size of the heart in every instance, although many have supposed that violent exercise carried to the point of physical exhaustion would inevitably result in great dilatation.

So, too, in the same issue of the *Archives of Internal Medicine*, these experimenters studied the influence of strophanthin when given intravenously in doses comparable to those used clinically. Here again they employed rabbits for their experiments and found that this drug caused a definite decrease in the size of the heart of the rabbits. Curiously enough this decrease was most marked in cases of experimentally produced myocarditis as evidenced by cardiac dilatation, and occurred to a less extent in normal animals.

An interesting point in this connection is their finding that under the conditions we have mentioned the heart usually begins to return to the normal size at the end of fifteen minutes and always recovers completely after two hours. While this may be true in rabbits, it is worth noting that clinicians seem to be universally in accord in believing that strophanthin, when given intravenously to human beings, maintains its effect over a very long period of time, so long that most bedside workers consider that a full dose should not be repeated oftener than once in twenty-four hours.

The question now arises as to whether the difference in results depends on the difference between animals and man or upon an error in observation. We believe that medical men who have used strophanthin intravenously will fail to be convinced from the investigations we have quoted that strophanthin is so fleeting in its influence as it seems to be in rabbits. If any of our readers are unconvinced of this and give the strophanthin too frequently, on the ground that its effects are fleeting, we feel sure that the accidents which will occur will soon convince them of their error.

Apropos of the sentence occurring earlier in this editorial in which we speak of the possibility of recognizing changes in cardiac size by methods ordinarily employed in physical diagnosis, attention may also be called to the communication by Friedman and Strauss, who, as a result of their investigations, which seem to have been carried out with the greatest care, on the changes in the size and shape of hearts during the progress of compensation, assert that compensation may be restored without any change in the diameter of the heart, that the chief changes in size are to be found in connection with the superior vena cava and the pulmonary artery, a variation which they think cannot usually be determined by percussion. They believe that variations in size in chronic heart conditions when determined alone by percussion are unreliable, and that in chronic heart disease there may be marked variation in

adequate function with slight or no variation in size.

The *x*-ray pictures which they publish fully support their conclusions, as do also the measurements which they have given in tabular form.

The important point for the physician is, therefore, not so much the size of the heart as the study of its ability to do its work, either by a consideration of its sounds or by a careful estimation of the manifestations of cardiac failure which may be found in other parts of the body.

SOME POINTS IN REGARD TO MEASLES.

It is an interesting fact that infants during the first few months of life are singularly immune to certain infections and singularly susceptible to others. As Herrman points out, erysipelas and septic and respiratory infections in this type of patient run a rapid and unfavorable course, whereas young infants are practically immune for the first five months to measles and scarlet fever. This is the more remarkable because it has been thought that much of the malignancy of scarlet fever depends upon the presence of a streptococcus, and this organism in one of its types is the cause of erysipelas. Another remarkable fact is that after the first nine months of immunity, susceptibility to measles is almost universal.

Herrman, after presenting statistics based upon much observation, asserts that under two months of age infants are absolutely immune if their mothers have had measles, and are relatively immune until five months, occasionally maintaining this relative immunity up to nine months, but that after the ninth month they join the group of susceptibles. He also finds that there does not seem to be much difference in the immunity between infants which are breast-fed and those which are artificially-fed, which also leads to the conclusion that the immune substances are not transferred so much by the milk as they are through the placenta in intrauterine life.

In the same issue of the *Archives of Pediatrics* that contains Herrman's communication, there is another by Ratnoff in which he points out that while measles is regarded as a mild or harmless disease of childhood, it nevertheless ranks at the top of the infectious diseases as a cause of death during the earlier periods of existence.

He also makes the interesting statement that the mortality from measles is greatest in the first year of life, which, when compared with Herrman's statement, means that its greatest mortality is in the last three months of the first year.

He then discusses the possibility of inducing immunity to measles by serotherapy, pointing out that certain investigations show that immunity can actually be achieved, and expresses the belief that such treatment has no contraindications. The serum employed is derived from patients suffering from the disease in its early stages, or with serum obtained from convalescents. Ratnoff's personal experience covers more than one hundred cases. The disease occurred in eight different hospital wards. All the children exposed to infection were immediately immunized, with the result that not a single case of fully developed measles occurred, although in about one-fifth of the children there was some trifling phenomenon, such as a faintly scattered rash or a slight rise of temperature. All of these children were under two years of age. Apparently the immunity does not last very long, since some cases have fallen victims to the disease two and a half months later. As we have intimated, Ratnoff thinks that this type of therapy has no danger and no contraindications, and then the physician should popularize this method, since by this means infant mortality will be materially diminished. The amount of serum used has been about 5 cc, but we would suggest that before it is injected intravenously the sensitiveness of the child be tested by the injection of a few drops subcutaneously, and that it may be well to determine if the bloods of the donor and the donee are in the same group.

ERUPTIONS DUE TO DRUGS.

The statement was once made to the writer of this editorial by the late Dr. Stelwagon, then Professor of Dermatology in the Jefferson Medical College and a well-known author of a standard book upon this subject, to the effect that whenever a patient presented himself with an eruption upon the skin which seemed to be unusual and difficult of diagnosis or for which it was difficult to discover a cause, he at once inquired as to whether the patient was taking some medicine which experience had taught him might induce such an outbreak.

Physicians have known for many years that belladonna causes a rash like scarlet fever and that antipyrin and the nearly related coal-tar products sometimes produce a measly rash. This is the more important since these products, when used for pain-relieving purposes, are often the chief ingredient of proprietary preparations, the label of which does not clearly indicate their content, so that even if the physician finds that some headache remedy has been taken he may easily overlook the fact that a coal-tar product therein contained is responsible for the appearance of the patient's skin.

In a recent issue of the *New York State Journal of Medicine,* Eller has contributed an interesting paper along these lines, showing in a picture an eruption due to the ingestion of phenolphthalein. He points out that most drug eruptions disappear rapidly when the cause of them is no longer taken daily, but also recognizes that after such a drug has been taken over a long period of time, its retention in the body or the lesions which it has induced may also persist for weeks. He reminds us of the well-known fact that the iodides produce six different forms of skin eruption, namely, the erythematous, urticarial, nodulo-pustular, eczematous, petechial, and bulbous; the erythematous form usually appearing upon the forearms, face, and anterior part of the chest. The vesicular form may develop from the erythematous form. The papulo-pustular form most commonly appears where the sebaceous glands are abundant, as on the back, face, chest, and shoulders. It is also noteworthy that he recognizes the development of iodide eruptions in infants nursed by mothers taking iodide of potassium.

Occasionally opium, or one of its alkaloids, will produce a pruritus, and practitioners of experience know very well that not infrequently after morphine is given hypodermically the patient is prone to rub the tip of his nose because it itches.

Of the newer hypnotics, it is stated that sulphonal may cause a diffuse scarlet rash with marked pruritus, and that this, as it fades, may be followed by desquamation, whereas barbital and barbital sodium may produce erythematous or measly eruptions accompanied by fever, and often cause the formation of blebs or erosions of the lips and mucous membrane of the mouth. The same thing holds true in regard to phenylbarbital. Eller also states that amidopyrin, neocinchophen and hexamethylenamine may produce angioneurotic phenomena of the lips and eyelids.

The presence of phenolphthalein as a laxative in many preparations now marketed to move the bowels renders the rashes that it produces of considerable interest. The most typical eruption that Eller has noticed is a macular erythematous rash varying in size from a pea to many inches, and in color from bright red or purple to dark brown, with a pigmentation which may remain for months or years after discontinuance of the medicine.

Sodium benzoate and benzoic acid may cause an erythematous papular eruption, and the various salicylates have been recorded as causing erythematous, urticarial and petechial rashes. In other instances the salicylates may induce an angioneurotic edema, or even a purpuric eruption, and it is noteworthy that the erythematous rash induced by salicylic acid bears a striking resemblance to that of antipyrin, belladonna, and chloral. Arsenic is capable of producing a variety of skin lesions, such as a papular urticaria, and is often followed by an exfoliating dermatitis,

which incidentally, it will be remembered, if it occurs after the use of arsphenamine absolutely contraindicates the further use of this drug.

It is needless to remind our readers that the bromides also produce skin eruptions varying from ordinary acne to furunculosis, and that chloral and quinine are also responsible for several skin lesions, quinine sometimes producing exfoliating dermatitis.

It is not possible for us to go into detail concerning all the points which are mentioned by Eller. What we wish to emphasize are the opening words in this article, namely, that whenever a patient presents himself with a skin lesion, particularly if it is unusual, the question of its being caused by a drug is to be given careful consideration.

BACKACHE.

Backache, at least in its transitory form, is, like headache, an accompaniment of such a multitude of disordered conditions, most of them of no serious moment, that in itself it does not often lead the sufferer to consult a physician. When severe and persistent it is usually an index of distinct, at least theoretically recognizable, often grave pathology, is generally considered an adequate reason for seeking professional aid, and is too often diagnosed as lumbago, whatever this may mean, and treated with salicylates or other similar preparations.

Both to the surgeon and the internist, and most of all to the patient, the recognition of its cause and the application of measures for its relief are matters of cardinal import. To the surgeon in the absence of a history of trauma, a persistent backache at or about the costovertebral angle suggests irritation of the kidney. It is often the single symptom of an unobstructing stone. Placed still higher and usually to the right of the spinous processes, if marked by intermissions of severity, it should direct attention to the gall-bladder. In the lower dorsal segment, central, to the left, or bilateral, severe to the point of exhaustion and persistent, a lesion of the lesser omentum and particularly carcinomatous involvement of the pancreas and the posterior wall of the stomach should be borne in mind. A steady and harassing ache in the lumbosacral region is at times an accompaniment of chronic inflammation of the prostate in man, of uterine displacement or inflammation in woman. In this relation Graves (*Boston Medical and Surgical Journal,* December, 1923) notes that few beliefs are more firmly held by medical men than that to the effect that there is a causal relation between pelvic disease and backache. He states that the most important gynecological cause of backache is malposition of the uterus, basing this belief upon the fact that of 500 cases of retroversion 76 per cent complained of this symptom, the pain always being referred to the lower lumbar and sacral regions. Moreover this backache was relieved by treatment directed to the uterus. Graves further calls attention to the fact that young nulliparous women with uncomplicated retroflexion are particularly subject to backache, and, moreover, that the suffering coming from essential dysmenorrhea is referred to the lower back in these women.

Graves calls attention to the type of backache associated with general prolapse following childbirth, accompanied as it usually is with retroversion and descent of the uterus and diastasis of the abdominal recti muscles. This backache usually gets well after a proper reconstruction operation. Especial attention is called to the effect of diastasis of the recti muscles mostly present in cases of prolapse. This causes a forward sagging of the abdominal contents and a strain on the lateral muscles, referred to the loin and back. The ache is placed somewhat higher than that incident to retroverted uterus. It is relieved by thorough support, or by an operation to restore the recti to their normal position. The author expresses his doubt as to laceration of the cervix being competent in itself to cause backache. The latter symptom may develop if there be associated with the laceration a posterior parametritis and

uterine prolapse. Cancer of the cervix uteri in its later stages produces severe backache, lateral in location and signifying an involvement of the pelvic lymph glands. The gynecologist is consulted by many patients for a backache which in reality is due to some orthopedic condition such as flatfoot, sacroiliac strain, lateral curvature, and rigid spine. Such patients consulting one unfamiliar with orthopedics may well be subject to unnecessary operations which produce no beneficial result. Bearing on the relation between backache and prolapse, it is pointed out that the greater the descent of the uterus the less frequent are the symptoms of tire and backache. It is held that the backache with which patients with genital prolapse often suffer is mainly due to a general tired condition.

As to the bone and joint causes of low backache pain, Osgood states that it is influenced by foot strain; weight bearing when this is present, throwing an additional stress on the back and sometimes on the hip. The backache symptoms may be more pronounced than those referred to the foot. Faulty posture is another cause of backache. Under the head of "Impingements and Relaxations" are included some of the results of faulty posture or those incident to more active and pronounced pathology. The line of treatment is in the direction of restoring the bones of the spine to that position which best fits them for their function, this by manipulations, exercises, or some form of bracing or support.

Injuries, at times apparently slight, are a common cause for continued and even crippling backache. Not until comparatively recent times has the frequency of compression fractures been recognized. These fractures require immobolization. Without this they are likely to cause long lasting or even permanent disability.

Anatomical variations are mentioned as a further cause for backache, Osgood stating that operations for the correction of these variations, especially those for removal of large transverse processes, are rarely needed and attended by some danger.

Osteoarthritis is a common cause of continued, harassing and even crippling backache, and is by no means confined to the aged. The condition is often initiated by trauma. It is best treated by splinting, by elimination, and by physiotherapy. It is noted that manipulations though giving temporary relief not infrequently aggravate the condition.

The toxic arthritides are common causes of backache and sciatic pain. The sacroiliac and the lumbar joints are common seats, and the treatment lies in the finding and the ablating of the focus of infection. This may be in the bowels and may take the form of intestinal stasis.

If the pain be persistent and severe, among other causes to be considered would be tuberculosis, syphilis, and neoplasms.

There are many patients suffering from backache, and particularly women, who on consulting their doctor receive but a casual examination and an opinion to the effect that their condition is due to nerves. That this particular form of misery is a common accompaniment of neurasthenia is well known. These people are habitually unstable as to their vasomotor mechanism. As a result or a sequel of emotional disturbances they are particularly subject to back pains probably incident to transitory circulatory disturbance. Because of their relaxed muscle tonus they also suffer from a habitual backache which Courtney describes as being referred to the lower cervical region and across the shoulders. The effort of support is for their weakened muscles too much. Courtney also speaks of that form of backache in the nervously adynamic referred to the lumbar region and associated with digestive disturbances. This he believes due to pull on the mesentery incident to gas formation.

In regard to treatment he advises, in addition to general hygienic measures, a diet selected not only from the standpoint of its nutritive value, but from that of the taste of the patient; the prevention of energy leakage; psychotherapy and medicinal agents, the latter directed toward sta-

bilizing the vasomotor system, for which purpose he regards the bromides as of major importance. He strongly urges against assuming the attitude that the backache of the nervously adynamic is an imaginary ill.

THE CAUSES OF INTESTINAL DISEASE.

It will be remembered that Lane has long preached and has practiced surgically, in accordance with his teaching, that absorption of toxic products from the intestinal tract incident to impairment in function or structure, and usually both, is at the root of all bodily ills. Indeed Baldwin quotes, and with approval, Lane's dictum to the effect that chronic intestinal stasis "is the cause of all the diseases which are acquired as the result of civilization." Baldwin (*Proceedings of the Royal Society of Medicine,* January, 1924) further states that 25 per cent of the patients attending hospital out-patient departments apply for relief of gastrointestinal disorders.

The reason for the prevalence of such disorders common to civilization, and apparently rare among primitive peoples, is one which should be carefully investigated. As to the comparative health of primitive peoples McCarrison notes that the natives in one section of northern India require no other attention from medical men than that needful for injuries and senile cataract. These people have little land to cultivate, are too lacking in food even to keep dogs, and feed on grain and dried apricots. Their winters are severe, their housing accommodations primitive. They are extraordinarily long-lived and have healthy and vigorous bodies.

It would seem logical to trace the disorders of function and later of structure so frequent among civilized people to the food ingested and to its quality rather than its quantity, since the latter is under normal conditions at least sufficient. Bearing on the quality of the food Baldwin presents a strong arraignment against white flour, polished rice, and peeled potatoes, and quotes Grenfell to the effect that in Labrador scurvy afflicted the inhabitants of numerous villages; investigation showed that they were living mainly on potatoes the skins of which had been removed before cooking. The scurvy was cured by cooking the potatoes in their skins, even though this covering was afterward removed before ingestion. Beriberi and deficiency diseases were observed in both Newfoundland and Labrador when the inhabitants subsisted on bread made of fine wheat flour. Under a diet of brown flour the disease was unknown. On the Norwegian ships beriberi was rarely observed until, yielding to popular demand, shipmasters were required by law to supply bread made from white wheat flour, or a mixture of wheat and rye. The heavy mortality among the Japanese sailors incident to the use of polished rice is well known.

Experimental work on deficiency diseases is quoted at length by Baldwin, who states that one of the earliest symptoms, at least in monkeys, is diarrhea. The intestinal lesions resulting from these deficiency diseases are briefly described. These lesions involve the glands, the muscular system, and the nervous mechanism of the intestinal tract.

From evidence based on clinical study, and convincing proof in so far as laboratory work is concerned, chronic gastrointestinal dyspepsia, mucous disease, colitis, intussusception, gastric and duodenal ulcer and chronic intestinal stasis may all be traced either directly or indirectly to ill-balanced diets.

Thus Yates is quoted to the effect that the Egyptian worker who lives principally on brown bread can easily carry a bale of cotton weighing 500 pounds. The Hindus of the Northwest Province can walk 50 or 60 miles a day on a diet of cakes made of whole meal and a little butter. The teeth of the people living on cereals, fruit and vegetables are remarkably good, their centers of population offering no inducement

to the dentist. Ninety-five per cent of the people of Australia and New Zealand using white bread have decayed teeth.

The importance of whole wheat bread has been recognized now for many years. Convincing arguments have been adduced as to the value of its habitual use. Hill states that "whole-meal or standard bread should be substituted for white bread. This question is of vital importance to the children of the very poor, brought up on white bread, margarine, and tea. . . . To grind the wheat and take away, not only the germ—the very embodiment of growth—but to impoverish the flour in most of the essential organic phosphorus compounds contained in the outer layer, seems a most extraordinary manipulation of the staff of life. More extraordinary still is the fact that the state allows this to be done, and does not insist on the miller notifying that the flour has been thus impoverished. If such a thing were done to any other article of food the law surely would step in."

At the present day it might seem that no single health measure could be more largely effective in the direction of maintenance of bodily vigor and prevention of disease than one so directed that the most important elements of the standard foodstuffs should be retained in the products sent from mills and markets for public consumption.

Perhaps the major benefit incident to the large use of cereals is due to the fact that they have not been devitaminized.

Progress in Therapeutics

Medical Therapeutics

Mercurosal in Syphilis.

VERDIER tells us, in the *New Orleans Medical and Surgical Journal* for March, 1924, that within the past year he has had occasion to use mercurosal, a synthetic organic compound of mercury containing approximately 44 per cent of mercury and having a very low toxic index, the formula being di-sodium-hydroxy-mercuri-salicyl-oxy-acetate.

This preparation has been used with uniformly good results, and the following cases are taken from his records as exhibiting the efficacy of this remedy in the different types of lues reported:

Case 1.—White female; examined September, 1920. No history of primary lesion; a few macular spots on forehead and various parts of body, very discrete in appearance; reflexes normal, no subjective symptoms. Her hair-dresser first called her attention to the "spots." Blood Wassermann four-plus; refused spinal puncture, and was very irregular in attendance for treatments.

Received during 1920 five injections of neoarsphenamine, doses 0.9 gramme each; during 1921 received one course of intramuscular injections of mercury salicylate averaging one and one-half grains each and numbering in all twelve injections, and during the latter part of that year received four injections of neoarsphenamine dose 0.9 gramme each. Wassermann in December, 1921, was two-plus with a four-plus Tchernugobow. Early in 1922 this patient received twelve intravenous injections of mercurosal dose 0.1 gramme in 5 cc of distilled water at three-day intervals. One month after taking course the Wassermann was negative; six months later the Wassermann was still negative, with no objective symptoms.

Case 2.—Early lues; white male, aged twenty-three. Macular rash over entire

body; general adenopathy; history of sore six weeks previous; Wassermann four-plus positive.

Treatment consisted of neoarsphenamine 0.8 gramme doses combined with mercurosal 0.1 gramme, the arsenic being given once weekly and the mercury twice weekly for a period of five weeks, at the end of which period the Wassermann was negative and the case symptom-free.

Two months later the Wassermann was negative, and three injections of arsenic with six of mercurosal as above outlined were administered.

Two months later the Wassermann was negative, and two injections of arsenic and four of mercurosal were given. Following this course the patient was tonsillectomized.

Two months later this patient presented a negative Wassermann and was symptom-free.

Case 3.—Acute lues; white male, aged twenty-eight. Chancre; dark field and india-ink positive for spirocheta pallida; inguinal adenitis, bilateral; duration of sore, one week.

Treatment: Eight injections of neoarsphenamine 0.9-gramme doses at weekly intervals combined with mercurosal twice weekly in 0.1-gramme doses. Wassermann negative, one week after treatment was concluded, and six months later Wassermann remained negative.

Case 4.—Late lues, meningeal type; white male, aged thirty-six, married. All sorts of treatment during last twelve years at irregular periods. Persistent vertico-occipital headache, knee reflexes absent, slight Romberg, negative blood Wassermann; spinal fluid shows a strong luetic curve with colloidal gold test, increased cell count and globulin, positive Wassermann, no increase of pressure.

Treatment: Ten injections of neoarsphenamine 0.9-gramme doses at weekly intervals combined with twenty intravenous injections of mercurosal 0.1-gramme doses administered twice weekly.

During the sixth week of the course the spine was again tapped, at which time there was an increase of pressure, but a decrease of all other previous findings. One week following conclusion the spine was again tapped with the following findings: cells normal, slight increase of globulin, weakly positive Wassermann to 1 cc, slight elevation of gold curve in the fifth dilution, all subjective symptoms improved. This case is again under treatment after a rest period of six weeks, and has received six intravenous injections of mercurosal in 0.1-gramme doses at six-day intervals, combined with sodium iodide intravenously in 30-grain doses every three days; all symptoms of headache have disappeared, and the man is at work and comfortable.

Mercurosal seems to be non-toxic in the dosage as cited, no reactions have been observed, beyond some transitory redness of the gum margins. There has been no occlusion or irritation of the veins noticed following injection.

In practically all of the cases mentioned the same vein, the median basilic of the left arm, has supported the entire series of treatments.

Verdier asserts that it would appear that in this new preparation we have a form of mercury which is well worth adding to our list of antisyphilitic remedies.

Difficult Midwifery in General Practice.

LUKER, in the *British Medical Journal* of November 17, 1923, discusses the difficulties resulting from breech labor. These include primary and secondary uterine inertia, prolonged labor, and extension of arms, legs, and head. There is generally no real risk to the mother except that of a torn perineum, but there is a definite risk to the fetus, especially in first labors, in which the mortality is certainly over 10 per cent. It is, therefore, important to prevent breech labor in primigravidæ; this can be done by performing external version before labor starts, and converting the breech into a vertex. The most suitable time at which this can be done is the thirty-fifth week.

Of recent years the treatment of ante-

partum hemorrhage has followed much more conservative lines than formerly. First, it is important to find out whether the bleeding is accidental or whether it results from placenta prævia. If the placenta cannot be felt by the finger passed through the cervical canal into the uterus, the case should be treated as one of accidental hemorrhage and an expectant policy adopted for at least twenty-four hours. The patient is put to bed—in a hospital—and a hypodermic injection of morphine is given. Plenty of fluid may be taken by the mouth, and in severe cases rectal saline may be given. The essentials are rest and warmth, so that the patient may recover from shock and the tone of the uterus may be restored. In many cases labor starts within twenty-four hours and spontaneous delivery takes place. If labor does not come on and fresh bleeding occurs, the best treatment is to rupture the membranes or to give an injection of pituitary extract. Either method will generally be followed by the onset of labor within a few hours. The advantage of rupture of the membranes is that labor is pretty certain to come on without delay; the disadvantage of pituitary extract is that its effect may wear off after a few hours and the uterus may again become atonic. If rupture of the membranes is followed by pains which are weak and infrequent, there is no objection to giving an injection of pituitrin as well.

The same method of treatment may be followed in some cases of placenta prævia, but more often the bleeding is severe and recurrent, if not continuous, so that steps must be taken to stop the bleeding by inserting a Champetier de Ribes bag or by performing version and bringing down a leg. But here again there are many cases which do very well if the membranes are ruptured and a tight binder applied. The treatment of placenta prævia by Cæsarean section is but rarely indicated, and should be reserved for special cases, as follows: (1) When the patient is a primigravida with a rigid undilated os and central placenta prævia, and the fetus is known to be alive. (2) When the patient is a multipara who has lost a lot of blood and can ill afford to lose any more. If he might emphasize one point in the treatment of antepartum hemorrhage, it is that the condition is one in which the advantages of treatment in a hospital or nursing home are very great.

He mentions the value of external version during the later weeks of pregnancy to convert a breech presentation into a vertex. In such cases it may be easy, but an anesthetic is often required. Version is also the correct treatment for a transverse lie, and in certain cases of placenta prævia. Version should never be performed to effect delivery when the presentation is a vertex and forceps have failed to effect delivery, for in such a case there is great danger of rupturing the uterus. This danger is very real in a transverse lie if version is attempted late in labor. Whenever the uterus is becoming irritable, and the pains are strong and frequent and cannot be completely abolished by anesthesia, it is unsafe to attempt version. In such a case the fetus is nearly always dead, and its life need not be considered as in any way comparable with the mother's safety. Delivery should therefore be effected after perforation of the fetal head in a vertex presentation, or after decapitation for a transverse lie.

In placenta prævia and in accidental hemorrhage the uterine wall may be weak in places and easily ruptured if any force is used in performing version. Version should not be persevered with if reasonable attempts are unsuccessful, as the failure may be due to insufficient liquor amnii.

As in antepartum hemorrhage, the cause of postpartum hemorrhage is generally (1) uterine exhaustion or lack of tone; (2) some placenta or membranes left behind in the uterus. In his opinion a most important predisposing cause of these two conditions is chloroform when given in fair quantity for a prolonged period, especially if pushed to a sufficient extent to allow the application of instruments. There is nothing which abolishes uterine contractions so

quickly and effectually as chloroform, or, to a less extent, ether; and if the anesthetic is given for any length of time there is likely to be difficulty in the third stage owing to deficient uterine contractions, and postpartum hemorrhage will occur.

Postpartum hemorrhage is also likely to follow the overdistention of the uterus by twin pregnancy or hydramnios. In such cases, therefore, it is very important to keep very careful watch over the uterus for at least an hour after the delivery of the infant, and to have preparations in hand for a hot vaginal and intrauterine douche. If hemorrhage occurs after the expulsion of the placenta a hypodermic injection of pituitary extract should be given at once, and should be followed by a hypodermic injection of ergot.

Acidosis in Infants and Children.

HESS, in *Northwest Medicine* for November, 1923, states that the treatment of acidosis must first be directed to the prevention of a further production of more acids; second, to replenishing the alkali reserve; third, to the elimination of the acids and their salts; and fourth, to the treatment of the underlying factors, whether they be acute infections, starvation, or organic diseases.

Large quantities of water should be administered by mouth, if it is tolerated. When not retained, subcutaneous or intraperitoneal administration of normal saline or Ringer's solution is to be recommended, the latter as often as every six hours, if necessary, during the early treatment. The total quantity of all fluids given should be recorded daily and every effort made to administer maximum quantities.

In the presence of non-diabetic acetone body acidosis glucose should be given in all cases. He does not attempt to discuss diabetic acidosis, the treatment of which has undergone such a great change since the development of insulin therapy. Three methods of administration are available: by mouth, rectum, or intravenously. By mouth, a 5- to 10-per-cent solution may be administered every two to four hours, in quantities depending upon the age of the child and the tolerance of the gastrointestinal tract. By rectum, a 5-per-cent solution is best employed, which may be administered intermittently at intervals of three or four hours, quantities varying from 60 to 120 cc (two to four ounces) being used, or in young infants and older children who are not too restless the drip method may be used. When there is a tendency to return the glucose solution, it may be necessary to compress the buttocks for at least one-half hour after each administration.

A careful record should be kept of all solutions administered by this method and so far as possible the retained fluid estimated. In most cases a liter can be administered in the course of twenty-four hours. For intravenous use, 5 or 10 per cent of glucose in Ringer's or normal saline solution may be used, depending upon the size of the child. From 60 cc in small infants to 300 cc in older children may be injected at one time, to be repeated as indicated.

For intraperitoneal injection normal saline or Ringer's solution may be used. Fifty to 500 cc may be administered by the gravity method. Glucose should not be administered intraperitoneally.

Alkalies are given a secondary place in the therapy of acidosis, due to concentration of ketone acids in young children, and this agrees with the more recent experiences of Marriott, Gamble, and Schloss. Glucose rather than bicarbonate is the prime agent in the treatment of non-diabetic ketosis. The same is true of the lactic acid type. Marriott found that when sodium bicarbonate is given the amounts of sodium and sodium ions in the blood are increased, and this increase disturbs the balance between the sodium, calcium, and magnesium ions. If administered, sodium bicarbonate should be given by mouth or intravenously. By mouth from 1 to 2 gm. may be given at four-hour intervals, dis-

solved in water. For intravenous use a 2-per-cent solution is best employed, as it is isotonic with the blood. The same amounts of solution can be administered intravenously as recommended for the administration of glucose.

Howland and Marriott found that the simplest indication that sufficient alkali has been administered is evidenced by shifting of the reaction of the urine to normal. When it becomes amphoteric or alkaline to litmus, we may consider that a slight excess has been given. Further administration should then be withheld, unless the urine again becomes more acid than normal. When the carbon dioxide tension of the alveolar air is above 30, recovery is usually spontaneous and soda is unnecessary. Edema, tetany and even convulsions have been noted following the administration of large doses of soda, more especially in young infants. These usually disappear with cessation of the soda medication.

While the administration of glucose as recommended may carry the patient over the first emergency period, insufficient amounts of carbohydrate are given in this way to meet its needs. Efforts should, therefore, be directed toward the further administration of carbohydrates by mouth as soon as the condition of the stomach permits. After a short period of rest, the time of which will be indicated by the ability of the stomach to retain inert fluids, which in most instances is not over six to twelve hours, further administration of sugars and cereals should be begun.

Thick cereal pastes, to which cane sugar or maltose dextrose compounds have been added, are usually best retained. They may be given in small quantities at two-hour intervals, or at longer intervals with the administration of corn or maple syrup, or honey in teaspoonful or larger amounts. Malted milk is often well taken. Milk chocolate and plain candy, such as caramels, are valuable and are usually well taken by children who have eaten them previously and have a liking for them. Various plain wafers sold on the market may be tried on the second day. Fruit juices sweetened and syrups, more especially orange juice, should be given in small quantities. If orange juice is retained, larger quantities diluted with sweetened water should be given and continued. Often one or more oranges can be fed in twenty-four hours during the first day after vomiting ceases. Skim milk, or better skim buttermilk, can usually be given by the third day. Whole milk and fats should be withheld until the child is convalescent.

The feeding of carbohydrates should be pushed as a preventive measure in the presence of acute infections.

The acute symptoms requiring further medication are gastric and intestinal distention and the retention of decomposing food in the intestinal tract, vomiting, and syncope.

To clear the intestinal tract milk of magnesia or some other mild saline laxative, together with enemata, is best. For vomiting in the presence of gastric distention lavage with a weak bicarbonate or citrate solution is often most beneficial. Small doses of carbolic acid (⅛ to ¼ minim), administered at two-hour intervals for three or four doses, together with tincture opii camphorata for the relief of vomiting and restlessness, are indicated. In the presence of syncope it may be necessary to administer cardiac and respiratory stimulants.

Arsenical Pigmentation of the Mouth and Skin.

STOCKMAN, in the *British Medical Journal* of November 10, 1923, states that during the prolonged treatment with arsenic of cases of chorea, pernicious anemia, lymphadenoma, psoriasis, and other chronic diseases, pigmentation of the skin and keratosis are not infrequently produced, but their occurrence must be considered as relatively very rare in proportion to the large number of cases which are so treated

without any untoward effects. It is notorious that arsenic causes these and other pathological lesions much more rapidly and after a much smaller quantity in some persons than in others. Thus pigmentation, keratosis, and neuritis may appear in a few weeks or months, all together or singly, or may not appear at all even after years of arsenic administration. The reason of this variation in action is unknown, and for the present it has to be put down to individual differences or idiosyncrasy.

The skin coloration fades with very varying rapidity, sometimes in a few weeks, sometimes only after months, or in two or three years, and Cheadle has recorded an instance of its being present after nine years and presumably permanently. In his (Stockman's) experience it almost invariably disappears fairly rapidly, and has no deleterious influence on the general health. This is also true of keratosis, although it also may be very persistent, and arsenic cancer may result from prolonged irritation of the skin by the drug. On the other hand neuritis, which is equally capricious in its incidence, is very tedious and difficult to cure, and its possible occurrence should always be carefully watched for and avoided. It may prove permanent and even fatal in extreme cases.

It is difficult to determine exactly when or by whom pigmentation of the skin was first noticed as a result of the therapeutical administration of arsenic. Arsenous acid, realgar, and orpiment have been used continously from the earliest medical times, and their acute poisonous effects have long been familiar, but knowledge regarding the symptoms of chronic poisoning has dawned much more slowly.

Arsenical paralysis is said to have been first recorded in the thirteenth century, and at infrequent intervals afterwards till 1857, when it was more particularly described by Leroy, and since then by very many others. In the eighteenth century, when various preparations of arsenic were widely and successfully used in the treatment of ague, it was known that they might give rise to paralysis and dermatitis, but there is no record of pigmentation. Thickening of the skin was noted by Hunt, and later by Wilson (in 1873), but it was only after 1888, when keratosis of the soles and palms and other parts was first definitely drawn attention to by Jonathan Hutchinson, that this very striking effect of the administration of arsenic came to be generally recognized. Its employment in chorea is also comparatively modern. Harles (1811) merely mentions it without comment of any kind, and Martin, Salter, and Gregory seem to be the earliest writers who published accounts of cases successfully treated with it. Later Begbie and Pereira spoke very highly of its value from their own experience. In 1877 Byrom Bramwell first advocated its use in pernicious anemia.

Arsenic was first employed accurately and systematically in skin diseases by Girdlestone of Yarmouth in 1806, and in 1847 Hunt, and later Devergie, in their treatises on diseases of the skin, describe brown and gray discoloration as if this were a recognized and not uncommon incident during its administration. Hunt describes the skin as having a "dirt-brown, dingy, unwashed appearance," and Devergie uses the terms "iron-gray" and "brown." Veiel (1860) says it occurs "not seldom." Since then it has been described in great detail by many writers. The color may be mottled light or dark gray, the mottling being due to irregularities in the depth of pigmentation, or it may be all shades of brown—pale, yellowish, coffee, bronze, dull coppery, or almost black. It is never equally deep over the whole surface, or even in the same area of the body, and the tint is often modified at places by hyperemia in underlying patches of the corium. Small roundish spots of unpigmented or more deeply or more slightly pigmented skin are always present, and this with the differences in color-shades gives an impression of mottling. Warty growths are often present. On the rosa of the lips and mouth the brown deposit is modified to a dark bluish color by the

underlying tissues and blood, as has been previously mentioned, other instances of the same kind being the more familiar "blue line" of lead poisoning, and the bluish color of the lips in dark-skinned races.

Erasmus Wilson in 1868 gave an account of the nature of the pigment, which he describes as the ordinary melanin of the skin, and relates a case in which the eyeball presented a "dark tinge" in addition to deep cutaneous discoloration. But so far as Stockman has been able to ascertain the two cases which he cites are the only instances in which pigmentation of the mucous membrane of the mouth has been recorded.

More careful examination of cases in which the skin is deeply pigmented would probably show, however, that the mouth is also not infrequently involved.

Diarrhea of Nurslings.

In the discussion which followed Nabarro's paper on this subject in the Section of Diseases of Children at the recent meeting of the British Medical Association, published in the *British Medical Journal* of November 10, 1923, BAUMANN (Johannesburg) said he had listened with interest and benefit to Nabarro's paper, which excellently summarized modern views with regard to the nutritional rather than bacterial origin of diarrheal disorders in infancy. Although he himself believed that certain forms of infant diarrhea were primarily bacterial in origin, it was nevertheless safe to treat all forms of this disorder upon a nutritional basis. If this were done attention would be concentrated upon dietetic measures to the exclusion of the use of drugs, vaccines, and other forms of treatment, which were generally useless and occasionally harmful. Except in very early cases he deprecated the institution of periods of starvation. The child had usually been subjected previously to such periods, and further starvation might easily convert the case into one of decomposition in which all further treatment was hopeless. In mild cases he had found that mere dilution of the previously administered milk mixture would suffice, especially if sugar or lactose additions were replaced by a less fermentable carbohydrate such as one of the dextro-maltose preparations. In somewhat severer cases protein additions must be made to the mixture. In very severe cases the use of Finkelstein's albumin (or protein) milk was indicated. The use of this preparation in his hands had robbed infant diarrhea of most of its terrors. It was necessary, however, when employing Finkelstein's albumin milk to make carbohydrate additions to the mixture from the very outset, lest the diarrhea be cured and the patient succumb to inanition.

Sweet of Auckland, New Zealand, suggested the use of skimmed milk powder as a means of treatment in cases of summer diarrhea. He had used it for many years in New Zealand, and had found it entirely satisfactory. It was simple in use, which protein milk (Finkelstein) was not, and the latter was difficult to prepare. After a few days on skimmed milk, when the number of stools had been reduced, 5 per cent of lactose was added, and later small quantities of dried milk containing fats were gradually introduced until the patient was convalescent.

Pritchard said that in fermentative diarrhea the stools were acid, and where there was proteolytic decomposition they were alkaline. The two conditions required different treatment. To give buttermilk was merely a coarse method of introducing the lactic acid bacillus. In proteolytic diarrhea he gave lactose with lactic acid bacilli. He found high irrigation of the colon very useful. In acid fermentation the indications were the reverse. Protein milk was then more scientific and successful. Indiscriminate treatment, either with protein or with sugar solution, was unsatisfactory. He did not agree with a previous speaker who had advocated dextro-maltose. Dextro-maltose was liable to ferment as well as other sugars. He reminded the audience of the very severe cases of

gastrointestinal disorder which used to occur when carbohydrate foods were given. He preferred a solution of pure casein to buttermilk, as it was less likely to contain microörganisms. For the same reason he found saline solution more satisfactory than whey. He agreed with the majority of speakers that cases might be both nutritional and infective. In 1911, in one hospital, there was a severe epidemic with a mortality of 50 per cent. Infants admitted to the hospital for other diseases died like flies in the wards into which cases of epidemic diarrhea had been introduced. In another institution, where the babies had been well fed and were not sickly to start with, there were no deaths and the duration of the disease was much shorter. These examples demonstrated the infectivity of the disease and the great influence of feeding on the course of an epidemic. The greatest mortality occurred among babies previously fed on carbohydrate.

Nabarro, in reply, said that for the sake of starting a discussion he had insisted perhaps a little too strongly on his theory that summer diarrhea was not infective. Not all cases were of the same type. There were a greater number of causes of diarrhea, but he thought that the primary cause in the great majority of cases was nutritional. Dysentery was more common now than before the war. One could not argue that because no lesion was found in the intestine post mortem the case was not infective, because in young children, even in typhoid fever, the intestinal lesions were very slight. He found that the reaction of the stools did not help much in diagnosis. It was quite possible that by increasing the acidity of the intestinal contents the growth of proteolytic organisms might be inhibited.

Paterson, in reply, said that in the treatment of diarrhea the first essential was to reduce fat. At Great Ormond Street Hospital treatment by starvation had been completely dropped. If it was persisted in children passed into a state of malnutrition from which they recovered with difficulty. To prevent dehydration hypotonic saline by the mouth was of considerable value. The child was fed every three hours, and between the feeds was given as much saline as it would take. He had known a child take as much as forty ounces of saline besides its feeds on the first day of treatment. It was a much better method than the subcutaneous injection of fluids. A large proportion of children reacted best to a high protein, low sugar diet. In his experience very few had a low protein tolerance. Protein curd seldom appeared in the stools, but fat curds were very common. The simple methods of treatment were the most effective. Well-skimmed cow's milk was usually well borne; sugar could be added; he had also found whey useful. Horlick's milk, which contains 1 per cent of fat and dextro-maltose, was the second step in treatment; he then gradually introduced cream. Drug treatment was of no value. He did not agree with intestinal lavage, as a routine.

Reasons for the Failure to Obtain Relief After Tonsil and Adenoid Operations.

GOLDBERGER, in the *Archives of Pediatrics* for November, 1923, concludes that sinusitis is a disease common in children and may occur at any age.

Children whose catarrhal conditions of the upper respiratory tract do not subside after tonsillectomy and adenoidectomy suffer in all probability from accessory nasal sinus disease.

Children who are operated upon for the return of adenoid growth are probably victims of sinusitis.

The antrum is the most frequently involved sinus.

Two forms of sinusitis are met with: the catarrhal (the more common), and the purulent.

Children should not be discharged as cured after upper respiratory infections (cold, grippe, etc.) and after the acute eruptive fevers, measles and scarlet fever particularly, until all signs pointing toward sinus involvement have subsided.

Children should return at periodic intervals after tonsillectomy and adenoidectomy to ascertain the condition of the sinuses. A hint as to the presence or absence of sinus involvement is often obtained while the patient is under ether.

Symptoms are usually constant in typical cases.

Complications, such as osteomyelitis, abscess of the orbit and brain, and meningitis, are not uncommon.

Diagnosis rests upon the history of previous events, roentgenograms, transillumination, and exploratory puncture.

Treatment is usually conservative. Suction is favored by most men. The consensus of opinion is that operations should be resorted to only after all other procedures have failed.

X-ray Treatment of Thyrotoxicosis.

In the *Chicago Medical Recorder* for November, 1923, HUBENY says that in order to determine the value of any form of treatment it is necessary to know and consider the percentage of patients suffering from the disease who recover without any treatment. Stanton believes that exophthalmic goitre is a self-limiting disease, and that in from 60 to 70 per cent of the cases spontaneous cures occur at the end of five or six years. Hale and Whitney followed 87 cases of exophthalmic goitre treated at Guy's Hospital, London. After a number of years it was found that 61 of these patients were cured, 21 vastly improved, and five remained unimproved.

These reports, if accepted, would seem to imply that if any form of treatment is of value, it must give a high percentage of cures or produce prompt relief of many symptoms. In this respect roentgenotherapy is to be the method of choice.

Early operations are better than late ones; this applies with equal force to the early use of the *x*-ray, for it is a rather unfortunate circumstance to advise roentgenotherapy as a last resort.

Experimentally it has been shown possible to destroy the glandular structures by subjecting them sufficiently to the Roentgen-ray. It is also known that the higher organized type of cell and tissues of the lymphatic system are especially vulnerable to the destructive action of this form of light.

The structure of the thyroid gland is somewhat allied to lymphoid tissues, and we often have an associated enlargement of the thymus gland. (Kocher found this to be true in fifty per cent of his operative cases.)

If these are the facts and the amount of irradiation sufficient to destroy the gland is not greater than that which will produce an injurious effect on the skin, it should be possible to remove all or part of the gland by roentgenotherapy, and produce results similar to those achieved by surgery without the danger connected therewith.

Great emphasis must be laid on the importance of careful diagnosis and the selection of patients to be treated. The physician best able to treat goitre must have developed sufficient judgment to enable him to select the treatment, medical, surgical, or roentgenological, best adapted for each individual case. To determine this a careful study of many factors is necessary.

In the past, operations have been performed on the wrong class of cases at the wrong time, either too late or at the height of the toxic symptoms. Many cases have been treated too long medically. The same can be said of many roentgenologists; they have treated cystic, calcareous or colloid goitres and expected results. Should the case not be one of thyrotoxicosis, irradiation may produce harm; therefore these cases should be studied by a competent clinician.

He has practiced two techniques:

Technique No. 1.—Interrupterless machine, broad focus Coolidge tube; parallel spark-gap nine inches; the rays filtered through 4 mm. of aluminum and 1 mm. of leather. The skin focus distance 8 inches. Three areas treated at each sitting, each area receiving two-thirds of an erythema dose.

Areas treated: (1) right half of thyroid; (2) left half of thyroid; (3) thymus region. This constitutes one treatment. Repeat in three weeks.

Give four such treatments, then stop for three months; this is considered one series. Then give a second series. If necessary, a third series may be given after waiting three months.

Technique No. 2.—Interrupterless machine; broad focus Coolidge tube; 9-inch parallel spark-gap; 4 mm. of aluminum filtration; one mm. of leather filtration. Skin focus distance, 14 inches. Sittings, 3 to 6. Areas, 5: (1) right anterior thyroid; (2) left anterior thyroid; (3) right anterior thymus; (4) left anterior thymus; (5) posterior cervical ganglion area. Dose, one-half erythema over each area. The same frequency of repetition as technique No. 1 applies.

The technique as given in No. 2 is the one of choice when patient is not highly toxic, permitting a gradual recrudescence of symptoms with less tendency toward recurrence. The areas over the cervical ganglia are included, based on the observations of Cannon that stimulation of these centers causes secretory activity in the thyroid; conversely, the action of the *x*-ray seems to inhibit their action.

Constipation from the General Practitioner's Point of View.

The *Lancet* of November 17, 1923, in its reports of medical societies, refers to a discussion of this subject by Des Voeux at a recent meeting of the Medical Society of London, in which he spoke of the unhappy experience, no doubt common to all medical men, of being consulted by an old friend, who thought he wanted a pill, as his bowels were not acting easily and his appetite had gone off a little—a patient whose general aspect was good, in whom an ordinary examination showed nothing until a finger introduced into the rectum discovered a large and irremovable mass. He contrasted this experience with the almost pleasurable feeling produced when another friend came to say that he felt "very ill and all to pieces" and looked it, but on examination showed nothing but a loaded rectum, and perhaps a loaded colon, showing him to be merely suffering from the secondary effects of constipation amenable to a course of some laxative. This complacent exaltation was, however, unjustified, for no healthy friend of a practitioner ought to have been allowed to get into such a condition, at any rate if he had ever consulted the practitioner previously.

This class of case and others similar were due to faulty medical teaching and would not be encountered so frequently had the consequences of bad habits been drilled into the minds of medical men when they were young. The profession should lay it down as a canon of sound and healthful existence that the bowels can and will act daily and naturally—that is, without medicament or extraneous help. There is too much of the attitude of mind of the physician who said when puzzled at a diagnosis, "Well, thank God, we have the bowels to treat." When he was young it was taught that a daily evacuation was essential, and the unnatural corollary was that purgatives and laxatives were freely and thoughtlessly administered; this doctrine apparently still exists, though perhaps it has been slightly modified. It certainly exists still in the nursery, where tender infants are constantly dosed for any slight ailment; all are familiar with the parent who announced at the doctor's first visit, "Of course, I have given a dose of so-and-so." He often wished that the whole of this class of medicine could be scheduled amongst the dangerous drugs, for he feels convinced that in the long run more harm is produced by them than by morphine, cocaine, and the like. In practice about half the doctor's work is connected with the stomach and bowels; individual members of the profession have little power to prevent the occurrence of diseases of the heart and lungs, but they have ample means of preventing those of the stomach and bowels

if they do but exercise them. The rectum and the bladder have much the same functions to perform under similar physiological management, but over the former comes the interference of the conscious mind, while the latter is governed almost unconsciously. The reflex action of the bladder, however, can only be restrained for a short time, whereas the rectum can be controlled to suit convenience. The result is that the number of bladder trouble cases to be dealt with is infinitesimal compared with that of troubles of the bowel. A healthy bowel means a healthy body; the druggist's shop provides a sop to Cerberus, which once thrown must be repeated at intervals.

Acute Lumbago Treated by the Injection of Quinine and Urea.

SOUTTAR, in the *British Medical Journal* of November 17, 1923, states that of common minor ailments there is none which may be more completely paralyzing than acute lumbago. In an instant an individual in the full vigor of health may find himself unable to make the slightest movement of the trunk without the most exquisite pain, and he may remain confined to bed for weeks as an absolute cripple. Even in the slightest cases, though the acute symptoms may pass off in a few days, it will be ten days at least before he can stoop with freedom and comfort. In severe cases the slightest movement, or even a sudden noise, may induce a spasm of pain, with a violent contraction of the lumbar muscles, a reflex attempt at protective fixation. The contraction may last for several seconds, and only slowly and cautiously will the patient allow the muscles to relax.

An attack is often brought on by a chill following exertion, such as may occur from sitting in clothes damp from perspiration. An attempted movement produces a spasm of pain, and after that free movement is impossible. The pathological basis is very obscure and probably involves a number of different factors. The circulation in the muscles, diminished by cold, is unable to remove the waste products resulting from recent activity. Probably the muscle responds to stimuli by an irregular spasm, and a few of its fibers are torn from their origin. This conception would at least explain the fact that it is almost always at a point of attachment that tenderness is most marked.

Though the sudden onset is strongly suggestive of a traumatic origin there is usually a slight but definite constitutional disturbance, and it seems probable that the trauma would be ineffective in the absence of some error in general metabolism, perhaps due to a low grade of infection. But the local symptoms are so severe as entirely to absorb the patient's attention. A close examination will indeed show that the source of these symptoms is even more narrowly localized than the patient imagines, and that the pain spreads from a very small focus characterized by exquisite tenderness to deep pressure. This focus may be situated anywhere in the lumbar muscles, and in addition to its excessive sensitiveness may be marked by a slight local swelling, with an edema which pits on pressure.

The precise localization of the focus of pain naturally suggests some local form of treatment, and a large number of methods have been recommended. Radiant heat, dry cupping, heavy massage, the insertion of long needles, and the actual cautery, all have their advocates; but the more lenient methods are tedious, whilst the more drastic are somewhat Oriental. It occurred to him that the injection of a local anesthetic would be a rational method to employ, and could at least do no harm. He was scarcely prepared, however, for the instantaneous cures which he has observed, and still less for their permanence.

The anesthetic he chose was quinine and urea hydrochloride in 1-per-cent solution, and he selected it because of the length of time, up to several days, for which the anesthesia may last. He thought at first that the action might be purely mechanical, and

he tried normal saline solution, but the effect proved to be only transitory. Five cubic centimeters of the solution is injected through a long fine needle into the center of the tender spot; within ten minutes the acute pain has entirely disappeared and the patient can move freely; a sense of stiffness remains, and a curious feature is that the patient may complain of a general malaise. It has seemed to him probable that some constitutional disturbance is a regular feature of the condition, but that it is masked by the severity of the local pain.

Cancer of the Tongue Under the Influence of Radium Electric Coagulation and X-ray.

HANFORD, in the *Chicago Medical Recorder* for November, 1923, states that the primary lesion should not be excised, but should be destroyed by embedding radium needles in the periphery of the lesion. If, however, excision is decided on, a prophylactic dose of radium should be employed soon after the operation.

Palpable glands that exist at the time of treatment of the primary lesion or appear soon after should be removed surgically, after which radium should be placed in the field of operation.

If the glands are not palpable, *x*-ray or radium packs should be applied over the submaxillary, submental and the entire chain of the cervical lymphatic system.

Protein Fevers, with Special Reference to Casein.

In the *American Journal of Physiology* for December, 1923, SEIBERT and MENDEL state that of twenty-one proteins, made and preserved in the usual manner, all gave febrile reactions when injected, except the alcohol-soluble ones. Of these latter—six in number—two gave negative results constantly, three gave some positive results, and one gave only positive reactions.

Casein when prepared in the usual manner always produced fever. The amount of casein injected did not seem to be an important factor since 50, 5 and 1 mgm. when injected in the same volume of fluid produced equally intense reactions. Furthermore, there was never any evidence of anaphylaxis in the rabbits regardless of how many previous injections or at what intervals they were given.

Extensive processes of purification of casein showed that impurities such as fat, salts and alcohol-soluble products were not the cause of fever, but the few negative results obtained suggested the presence of a pyrogenic contamination in the reactive preparations.

With a knowledge of the cause of the pyrogenic property of some distilled waters, casein was prepared in a manner to prevent bacterial contamination. This preparation gave no fever. The experiment was duplicated. Non-pyrogenic casein, however, may become pyrogenic on standing under non-sterile conditions, again pointing to the bacterial nature of contamination.

Fresh, practically sterile milk, containing only 3000 to 4000 organisms per cubic centimeter, gave fever in doses larger than 1 cc. Therefore, either sufficient bacterial toxic products are formed *in vivo* in the milk or else there is some other constituent of the milk than fats, salts, and casein which is able to elicit fever in rabbits.

Fresh sterile egg-white did not produce a fever. Although ordinary crystallized ovalbumin injections were followed by fever, some suggestive negative results were obtained with egg proteins prepared in a manner to eliminate bacterial contamination. Similarly promising but inconclusive negative results were obtained with certain samples of edestin and hemoglobin. While the results with these three proteins have not as yet been adequately confirmed, they are presented as promising evidence and merely suggest to the authors that completely satisfactory conditions have not yet been obtained for their preparation as is the case with casein.

These results, together with the numer-

ous negative reactions obtained with the alcohol-soluble proteins, where bacterial contamination would necessarily be checked by the method of preparation, and the knowledge of the cause of water fevers, would seem to indicate that protein *per se* may after all not be the cause of fever in the so-called "protein fevers."

The Radium Treatment of Chronic Myelogenous Leukemia.

BIGGER, in the *Virginia Medical Monthly* for November, 1923, states that he has obtained very satisfactory temporary remissions in all of his (five) cases of chronic myelogenous leukemia treated with radium.

One case developed an acute leukemia, and there was a lethal exodus.

Radium seems to have no effect on acute leukemias.

Surface applications over the spleen with moderate dosage seems the safest and most efficient plan of treatment. He says that with our present methods radium is not curative, but is our most satisfactory agent in the treatment of chronic myelogenous leukemia.

With improvement in the technique of application we should obtain more satisfactory and more lasting remissions.

Convalescents' Serum and Measles Virus in the Immunization of Children Against Measles.

KEMMERER, in the *United States Naval Medical Bulletin* for November, 1923, states that because of the high mortality of measles in young children affected by other diseases, it is important to prevent infection with measles until after the fourth year, preferably the sixth year, of age.

It appears to have been definitely determined that 3 to 4 cc of serum of convalescents taken between the seventh and fourteenth day after defervescence, injected subcutaneously or intramuscularly into a child of 3½ years of age, before the sixth day of incubation, will prevent the development of measles. From the eighth day on the serum, even in large doses, will not prevent the development of the disease. In older children larger doses should be given.

In case convalescents' serum is not available, that of adults who have had measles may be used in large doses, 30 cc, but the results are not as certain. Where the facilities for collection of serum are not available, the whole blood, fresh or citrated, may be used.

The duration of immunity following the use of convalescents' serum is at least four weeks, possibly considerably longer.

The attempts of Herrmann to transform the temporary immunity of infants into a permanent immunity by inoculating children under five months of age with the virus contained in the nasal secretions seems to have met with at least partial success.

The work of Hiraishi and Okamoto suggests the possibility of producing immunity by the use of small doses of virus as contained in the blood.

Milk Injections in Ophthalmology.

STEVENSON, in the *Ohio State Medical Journal* for December, 1923, states that in the eighteen volumes of the *American Encyclopedia of Ophthalmology* there is apparently no reference to this form of treatment. Mueller and Tamer, of Vienna, have used this method extensively. He believes that sterilized milk is one of the most useful analgesics.

Cow's milk contains the following proteins—casein, lactoglobulin, and lactalbumin. It also contains a large variety of enzymes, fats, and inorganic salts. In sterilized milk there must be a considerable quantity of dead bacteria, which may also act as a vaccine. The chief function of the injection of milk is its use in nonspecific protein therapy. It tends to produce in addition a hyperleucocytosis.

The milk is sterilized twice—first, it is boiled in a large test tube for ten minutes; the second time it is boiled for five minutes.

Generally the initial dose is 3 cc; later the dose is doubled. These doses can be given at least three times a week. The hip or the arm may be used and alternated as the site of injection. If a large dose is given (up to 8 cc), half may be given in one part of the body and the rest in some other part. In his experience no cases of local trouble have followed its use.

He has never used it subconjunctivally and never expects to do so. At times stock vaccines have been alternated with the milk injections. They often act well together. Milk injections do not cure trachoma cases, but they do relieve the corneal irritation and lessen secretion.

After leaving the medical school he was an interne at the Illinois Charitable Eye and Ear Infirmary in Chicago. A number of cases of trachoma came to that institution from southern Illinois. These patients had setons in their backs for the relief of their trachoma, placed there by a noted oculist of central Illinois. The seton caused a free flow of pus; with this there must have been an increased leucocytosis. Many of these patients also had the lobes of their ears pierced and thread tied in same, probably with the same result. Such methods are doubtless unnecessary, but they give clear indications for getting these benefits in a simpler manner.

He has never had more reaction, either local or general, follow the use of milk injections than from the use of stock vaccines alone.

Although its use as a hypnotic has never been mentioned so far as he knows, in his experience it has enabled the patient to sleep in many cases, such as iritis, when all ordinary remedies have failed. Its greatest use in ophthalmology lies in diseases of the anterior segment of the eye. His experience in diseases of the eye in order of relief is: (1) iritis; (2) keratitis; (3) cyclitis; (4) conjunctivitis, gonorrheal, and so forth.

Photophobia is a symptom which will often markedly lessen under milk injections. Vitreous opacities and turbidity of the aqueous and cornea will clear. It gives great relief in the early irritations of interstitial keratitis. He has not used it in orbital cellulitis, but will try it on the next case coming under his observation, as some good reports have followed its use.

It is of paramount importance in the treatment of any ocular inflammation that all focal infections be diligently sought for and eradicated. The *x*-raying of all the teeth, with careful examination of the sinuses and tonsils and other points of possible focal irritation in the body, must be thoroughly carried out. The local treatment with atropine and dionin is generally indicated in addition to general treatment. The use of other non-specific protein injections such as typhoid vaccine or the various phylacogens may be helpful as variants to the milk treatment. He believes this treatment would be of great use preliminary to ocular operations. If he were to undergo a cataract extraction he would insist on an injection of milk several days before the operation. He has had very beneficial results in ear and nasal sinus cases.

The Relation of Lung and Throat Operations to Lung Abscess.

LYMAN, in the *Journal of the Missouri State Medical Association* for December, 1923, states that the following conditions may add to the possibility of this complication: Prolonged operations; undue manipulation of the tonsils; laceration of the fauces; manipulation sometimes necessary in controlling hemorrhage; improper position of the body during operation under general anesthesia; not guarding against the inspiration of blood or vomitus until the complete recovery of the patient from a general anesthetic; failure to use an efficient suction apparatus.

We should take every possible precaution in operations in the upper air-passages to prevent such a serious complication as abscess of the lung, and the following suggestions are made as tending to diminish the possibility of this condition:

Tonsillectomy, especially upon an adult, should not be looked upon as a minor surgical procedure, but should be performed with all the care of other major operations, namely, that it should be done in a good hospital and should be preceded by a careful, general, physical examination of the patient; no preliminary injection of morphine or drugs of similar character should be given because this tends to abolish the cough reflex, which is our greatest safeguard against the inspiration of infective material. If ether is used, the anesthesia should be uniformly light, the patient placed in a position in which the blood cannot flow into the trachea, and an efficient suction apparatus should be used. The same precautions would seem to be indicated in the use of nitrous oxide, although the danger of pulmonary complications following the use of this anesthetic is much less than following ether. If local anesthesia be used, care should be exercised not to abolish the cough reflex, by applying the anesthetic to the posterior pharyngeal wall. After the operation the patient should be kept on the side, or prone, until consciousness is completely recovered. Patients should not be operated upon too soon after an acute infection. Swabbing and other manipulations of the tonsillar fossæ, to control hemorrhage, should be avoided if possible to prevent dislodging a thrombus from the veins. The patient should be kept under observation until all danger of this or any other complication has passed.

The literature on this subject in recent years would lead one to believe that this condition is a very common sequelæ of operations in the upper air-passages, especially tonsillectomies. However, such is not the case. The total number of records of tonsillectomies reviewed by Moore was about four hundred and fifty thousand; consequently, he estimates that pulmonary abscess occurs only once in every twenty-five hundred to three thousand cases. Lyman believes that by calling attention to the possibility of this complication and adopting proper precautions nearly all of these cases can be prevented.

Prevention and Treatment of Simple Goitre.

In *Northwest Medicine* for December, 1923, KIMBALL states that until some method is found whereby the iodine deficiency in food and drink can be supplied, the prevention of goitre should be accomplished through our schools as a matter pertaining to public health and to education.

The administration of iodine in small doses once a week throughout the school year, under the supervision of the school nurse, is the most practical method of goitre prevention.

Recent examinations have shown that the incidence of goitre in boys would warrant the application of this principle of goitre prevention to boys as well as to girls.

The prevention of goitre during pregnancy is as important as its prevention during adolescence, and should be a part of the routine care of every expectant mother. The same method as that applied to small children can be employed: 10 to 20 mgs. of iodine per week throughout the entire term should be ample.

He asserts that in the treatment of goitre the dosage of iodine should be considered in terms of mgs. rather than of grains. Ten mgs. of iodine daily for thirty days should be the maximum amount of iodine given to any patient during a single period of administration.

A Preliminary Note on the Use of Red Bone-marrow and Spleen in the Treatment of Anemia.

LEAKE and EVANS, in the *Wisconsin Medical Journal* for December, 1923, state it is their purpose in this preliminary communication to indicate the types of anemias in which the use of this preparation has been found valuable. These may be placed in the order in which the most marked response and improvement has been obtained.

Grave chronic secondary anemias of undetermined origin, having many of the characteristics of the progressive pernicious

type (high color index, abnormal forms of erythrocytes, marked pallor, dyspnea, and cardiac disturbances, and in which iron and arsenic, and in some cases transfusions, had failed to bring about a favorable response.

Grave active secondary anemias of acute septic infections.

Chronic anemias found as an accompaniment of chronic infections.

Dietary anemias of infants, in which if the patient is too small to take capsules, the preparation is administered in boiled and filtered aqueous solution as a broth.

Menorrhagic anemias.

Mild chloro-anemias of adults.

The value of this treatment in so-called primary progressive pernicious anemia is doubtful. In such cases the blood-making organs are in such a state that response to any stimulus seems only temporary, and the reaction noted clinically indicates that stimulating these paralyzed hematopoietic centers is apt to be followed by a sudden drop in the erythrocytic production. The differential diagnosis between essential anemia of the progressive pernicious type and grave secondary anemia in which the blood-making functions are inhibited rather than permanently destroyed is difficult. The reaction of each type to bone-marrow and spleen has been characteristic. In the progressive pernicious type there has been a drop in the cell content of the blood after a primary rise, while in the secondary anemia no such drop occurred. The type of reaction, therefore, has been considered of diagnostic value, the drug being discontinued whenever it fails to produce a positive response. Clinical and experimental observations indicate that the compound stimulates cell production and prevents excessive cell destruction, because of increasing cell resistance. If this assumption is correct, then it is indicated whenever the blood-making function is crippled, or whenever there is increased red-cell destruction as in acute or severe chronic infections.

It may be claimed that this preparation is only active because of its iron content. This has been experimentally determined by Wong's method, and has been found to be between 2.5 and 3.0 milligrammes of water-soluble iron per gramme of combined material. Since the normal daily iron intake is between 15 and 30 milligrammes, the iron received in the normal daily dosage of three 0.3-gramme capsules would be about one-tenth of the iron ordinarily ingested on an average diet. It is doubtful whether such a small increase in the iron intake would so strikingly affect the number of erythrocytes and the hemoglobin.

Desiccated red bone-marrow and spleen combined in equal proportions and administered in 0.3-gramme capsules three times daily has been found beneficial in certain types of anemia. It is desirable that independent clinical studies be made of the value of this preparation in the types of anemias mentioned, in order that proper appraisal may be made of this therapeutic measure.

Practical Heliotherapy.

TURNBULL, in the *Atlantic Medical Journal* for December, 1923, states that the State Sanatorium for tuberculosis at Cresson is located on the top of the Allegheny mountains, where weather conditions are as severe as in any part of Pennsylvania. Since 1913 approximately 250 beds have been used for the treatment of children between the ages of six and sixteen years. These children are tuberculous or of the type ordinarily spoken of as pretuberculous. Approximately 10 per cent have had positive sputum. The majority have been taken from homes where they have been exposed for some time to open cases of tuberculosis. They are undernourished, with a tendency to irregularity of temperature. Glandular enlargement and râles are present in most of them. Purely surgical tuberculosis has not been admitted to the institution except where complicated by pulmonary tuberculosis.

From 1913 until the spring of 1919 these children were treated in the ordinary manner. They were kept in the open air as

much as possible, were sent to an open-air school when their physical condition permitted, but no special effort was made to expose their bodies to the sun.

In 1919 it was decided to try the results of sun exposure. The children were divided into two classes. The first class consisted of those who had complicating surgical tuberculosis or who were too sick to be allowed school and playground activities. The second and much larger class consisted of the children who went to school and exercised on the playground.

The first class was treated after the method of Rollier. Under the eye of the nurse the children were given sun exposure, gradually increasing the area exposed and the time of exposure. At first the feet and legs as high as the knees were left uncovered for fifteen or twenty minutes daily. Special care was used to avoid sunburn. Gradually increasing the time and area, by the end of the third week the entire body could be exposed to the sun. An arbitrary maximum of three hours' exposure daily was decided upon, this being divided into two periods of an hour and a half each.

While the results secured from this treatment have not been perfect, they have been so encouraging that he would not be willing to give it up. Contrary to their fears no bad results were seen even in the positive sputum cases. In only a few cases was there a tendency to headache, rise of temperature or muscular pains after exposure. In most of the cases, headache and rise of temperature were controlled by protecting the head with a straw hat. The good results were shown by the rapid disappearance of cough and of joint pains, the drying up of discharging sinuses, greater regularity of temperature, and the rapid filling out of wasted muscles even in cases taking no exercise. The children have been happier, their appetites better and their gain in weight more rapid than when treated in their beds by former methods.

In treating the larger class of ambulatory children it seemed inadvisable to restrict normal activity or to interfere with school work to the extent necessary for carrying out this complete heliotherapy treatment. A modified form of treatment was therefore adopted. The boys were dressed in the lightest cotton bathing suits that could be procured. For the girls a loose-fitting, one-piece, bifurcated garment was made, reaching from the angles of the scapulæ to the middle of the thighs, and held up by narrow shoulder-straps. Shoes, stockings and underclothes were discarded. These suits were worn constantly at school and at play. It was the original intention to dress half the children in this manner, allowing the remainder to wear the clothing usually considered necessary, hoping in this way to secure a check on their results. This plan had to be abandoned for the sake of peace, as the undress uniform proved too popular.

While it is inadvisable to be too positive as to the relations between cause and effect, it is the opinion of those who have been caring for these children the past ten years that they have never done as well or improved as rapidly as they have since the introduction of heliotherapy. It is certain they have never been as happy or looked as well. During the period of sun treatment the children have enjoyed remarkable freedom from ordinary colds and nasal infections, in spite of the fact that they have worn their scanty uniforms on the playground during rains as well as in the sunshine. Their eyes have seemed brighter, their vitality greater, their appetites better, their sleep sounder, and their improvement more rapid than ever before.

It is always easy to become enthusiastic over anything new in the treatment of tuberculosis. Given proper regulation of life and activities the general tendency of the disease is toward improvement. The tendency of the patient, and often of the enthusiastic physician, is to credit this improvement to whatever new or unusual treatment was being tried at the time. The general impressions of those who are handling tuberculosis cases in large numbers, who have from repeated disappointment

lost the beautiful credulity of the enthusiastic beginner, are often of greater value than are the statistics of the enthusiast.

At the Cresson Sanatorium they have been fortunate in retaining a considerable number of their staff ever since the early days of the institution. Five years ago the freely expressed opinion of these unprejudiced and undeluded observers was that one winter was worth two summers in the treatment of tuberculosis. After five summers of heliotherapy this feeling has unconsciously changed, and the coming of winter with its long rows of sunless days is now dreaded, where formerly it was welcomed. To one who knows the wisdom and the freedom from delusion of the level-headed doctor or nurse who has watched fifteen thousand patients pass through a sanatorium, this means more than the statistics of the enthusiast.

Note on Boelke's Method of Using Sodium Morrhuate in Tuberculosis.

LEONARD ROGERS, in the *British Medical Journal* of December 29, 1923, states that he is indebted to Boelke for kindly sending him a copy of her paper, and regards both the method of administration and the results obtained as of great importance for the following reasons. The first trials of sodium morrhuate reported by him in 1919 established its specific action on tuberculous disease, as shown by febrile reactions with swelling of tuberculous glands, increased discharge from tuberculous sinuses, and occasionally hemoptysis in lung cases; all effects that may be followed by improvement. Recently he discussed the probable mode of action of the drug. Boelke's interesting observation of local reactions at the site of subcutaneous injections of the drug in tuberculous cases confirms its specific action on this disease. General reactions may, however, be excessive, for during the past year cases of spread of the disease in the lung, of fresh patches of tuberculous dermatitis, and in one case of apparent generalized tubercle, have followed the use of intravenous doses; so the drug, like tuberculin, is capable of doing harm, and this necessitates great caution in its use, although the very fact that it exerts such definite influence on tuberculous tissue indicates that it may have a beneficial action, if this can only be kept within safe limits.

It is precisely in this direction that promise is afforded by Boelke's plan of giving small subcutaneous doses of freshly prepared solutions—a point Rogers believes to be of great importance—such doses as do not produce local reactions at the site of injection, which appears in her hands to have eliminated the dangerous general reactions sometimes following the larger intravenous doses formerly advised by him on the basis of their effectiveness against the much less toxic acid-fast bacillus of leprosy. The new method of administration, if confirmed by trials now being carried out by experts in this and other countries, may furnish a safe, simple, and exceedingly cheap method of treating at least a fair proportion of tuberculous cases, although prolonged observations will be necessary before the precise indications for its use can be worked out.

The Capillary Blood-pressure in Arterial Hypertension and in Nephritis.

BOAS and MUFSON, in the *Journal of Laboratory and Clinical Medicine* for December, 1923, state that forty-five patients with arterial hypertension were studied over a period of from six to fifteen months. Of the 17 with high capillary pressures 8 have died; of the 28 with low capillary pressures only 5 have died.

Necropsy studies and observations on two patients with scarlatinal nephritis do not support the theory that high capillary pressures are indicative of glomerulonephritis.

In most patients the capillary readings taken at long intervals are constant. With few exceptions, high capillary pressures are accompanied by high diastolic pressures, and in these cases there is a certain parallelism between the two pressures, but

a case of subacute nephritis with normal blood-pressure and high capillary pressure is reported.

In patients with hypertension nitroglycerin lowers both the arterial and the capillary blood-pressures.

Hypertrichosis and its Treatment.

McCAFFERTY, in the *New York Medical Journal and Medical Record* of December 5, 1923, states that Giovanni claims that the changes produced in the single hair follicle as well as in the hair matrix and sheath of the hair are so great that electrolysis may be considered successful. The apparatus necessary is well known to all. It has been his (McCafferty's) practice to use a needle-holder, etc., which will permit the needle to be placed at any angle. By using this holder the hand may rest upon the face and prevent tremor of the fingers. The needle should be extremely fine and pointed. The electrode, which is the positive pole, may be about three inches square and is covered with wet absorbent cotton. The needle-holder is attached to the negative pole. This should never be reversed. If it is, the current will cause a charring of the tissues and a black spot will remain permanently. Gilchrist has found the use of a magnifying lens valuable in doing this work. Daylight is preferable for this work, but it may be done at night by the aid of a blue tungsten light.

There are a few things one should bear in mind in order to obtain the best results. As a general rule one-half milliampere on the upper lip and on fine lanugo hair has been found best. For all other locations on the face when one is dealing with hair that is coarse and deeply embedded in the subcutaneous tissue one milliampere is suggested. It was never necessary to go above this amount. It has been found advisable to equip oneself with a milliamperemeter which may be placed near the operator's head. The distance between each milliampere should be about an inch. This will make it possible for the operator to read accurately from one-tenth to one milliampere. One may use the same milliamperage each time upon the same patient, thereby obtaining uniform results.

The needle should be placed directly into the follicular mouth, following the hair follicle to a depth varying from one-sixteenth to three-sixteenths of an inch. If the needle does not enter the hair follicle it meets with resistance and a blanching of the skin occurs around it. If the needle is properly inserted, a white foam or froth exudes from the hair follicle. This is due to the liberation of hydrogen within the hair follicle. While the needle is still in place, the hair is removed with the slightest traction. When noticeable traction is necessary, it means that the hair bulb is not completely destroyed, in which case the operator should return to it in a few minutes and by the slightest traction it will slide out. The electrolytic action evidently continues for several seconds after the needle has been withdrawn.

A few minutes after the hair has been lifted from the follicle, a tiny brown halo appears, showing that destruction has occurred. Following this there appears a pin-point-sized umbilicated vesicle which is slightly yellow; later a slight edema or wheal appears. The above reactions are increased and hastened by increasing the milliamperage. In twenty-four hours a small crust forms over the umbilicated vesicle. A scab generally falls within a week, leaving a brownish-red pigmented spot. The pigmentation fades completely in three to six weeks, leaving in some cases a barely noticeable white scar, whereas in other cases no visible trace is left.

The number of treatments required for a patient with hypertrichosis varies with the amount and type of hair. Lanugo hair may be removed at the rate of one hair every thirty seconds, using one-half of a milliampere. Coarse, stiff, deeply embedded hairs will require one minute at one milliampere. Hairs from a mole require two minutes at one milliampere. Two or three weeks after the hairs have been removed from a mole, one will notice that the mole has partially dis-

appeared. It is advisable to remove the remaining pigmentation. Care should be taken that the patient is not subject to keloidal formation, for obviously a keloid will develop on the nevoid site. The hairs upon any location should not be removed too closely, otherwise the area will become edematous and indurated. When the induration has undergone involution, scarring or atrophy may remain.

A few hairs do return after electrolysis. This is due either to insufficient destruction of the hair papilla or to a curving of the hair root in the subcutaneous tissue. The curving root is found usually on the anterior neck. When all the coarse hair has been removed from a case of excessive growth on the sides of the face, chin, and upper lip, a fine lanugo may grow. Brocq calls this a secondary growth. He states further that even a third growth may appear. This, however, is the exception rather than the rule.

Studies on the Pharmacology of Sodium Citrate.

LOVE, in the *Journal of Laboratory and Clinical Medicine* for December, 1923, states that the heart muscle of dogs is depressed by doses of 30 mg. sodium citrate per kilo or more.

The vasomotor center is stimulated by suitable doses of citrate.

The cardio-inhibitor and cardio-accelerator centers are stimulated.

The endings of the accelerator nerves to the heart are markedly stimulated by large doses of citrate.

There is some evidence that large doses cause active dilatation of the vessels of the kidney.

Plethysmograph tracings of the extremities and intestines show no peripheral action upon blood-vessels.

Sodium citrate, in the dose used and at the rate injected in blood transfusions, produces no effect upon circulation which would militate against its use as an anticoagulant for blood to be given to a donee.

[Thirty mg. to the kilo is a quantity far in excess of the dose received by a patient who is suffering with so-called citrated blood.—ED.]

Fever-producing Substance Found in Some Distilled Waters.

SEIBERT, in the *American Journal of Physiology* for December, 1923, states that fevers may be produced in rabbits by the intravenous injection of distilled water as it is usually found in laboratories. [This not rarely occurs in man.—ED.]

The fever is not caused by the manipulation of the animals necessary to the determination of hourly temperatures. It is not dependent upon the rate of the injection of the water, nor is it due to a contaminating substance from a Berkefeld candle. The resistance and hypersensitiveness of the individual animals, as well as the influence of previous injections, do not determine the fever.

Hemolysis of the blood and hydrogen ion concentration of the solutions higher or lower than that of the blood are not the causes of fever.

Impurities, such as inorganic salts, glass dissolved from the container, gases from the air, constituents of the cork stopper, have all been excluded as probable factors in fever.

Water can be assured to be non-pyrogenic by distilling it through an all-pyrex apparatus containing a spray-catching trap and then using it within twenty-four hours.

A study of the nature and properties of the pyrogenic substance showed it to be present in some but not all distilled waters.

It may develop in a water in four to five days, is filterable through a Berkefeld candle, and is destroyed by long drastic heating only.

The pyrogen is a filterable product produced by a specific bacterium, some of the properties of which are given. Filtrates from other bacteria isolated from both pyrogenic and non-pyrogenic waters did not give fever.

Delivery of Shoulders in its Relation to Perineal Lacerations.

KICKHAM, in the *Boston Medical and Surgical Journal* of December 13, 1923, says that all writings and text-books on obstetrics call attention to the fetal head in its relation to perineal lacerations and duly impress on the obstetrician the importance of careful delivery of this presenting part for the avoidance of lacerations, but in most cases the relation of the shoulders to these perineal tears is ignored.

With a cephalic presentation, as the head "crowns" and thus stretches the perineal tissues to the utmost, it is rare, especially in primiparous patients, for the tissues in this region to maintain their integrity. It is usual to find at least a small solution of continuity of the skin in the vicinity of the central perineal raphe, and this small break may extend itself into the deeper muscular layer or up into the vagina, unless extreme care is taken as the head is delivered; but in the majority of cases the attendant watches, at this time, to prevent this bad effect from the cephalic presenting part, and as he notes the head is delivered with a very small laceration he congratulates himself on the good result, but at this point the "watchful waiting" is abandoned and little thought is given to the next stage, the delivery of the shoulders.

After delivery of the head external restitution takes place, and this is the result of the rotation of the shoulders under the arch, so that at this time the shoulders lie in a direct anteroposterior position or in one or the other of the oblique diameters. While it is true that the head is the largest and least malleable part and since that was delivered, sufficient room must be present for the delivery of the shoulders, these latter, unless delivered properly by being allowed to mold into a smaller diameter, actually present a definite impediment to delivery because of their size or position.

If after delivery of the head, strong traction is used to deliver shoulders, it will be noticed that the posterior shoulder impinges on the perineum in about the exact spot of the initial small perineal laceration, and that continuance of this posterior shoulder pressure increases the depth and extent of this initial laceration, so that a gutter is formed, through which the posterior shoulder is delivered; this increase in depth and extent of laceration is augmented in direct proportion to the resistance offered by the anterior shoulder as it impinges on the pubic arch. Thus it is common, after careful delivery of the head, with a very small "nick" in the perineum, to find, after completed delivery of the baby, an extensive laceration of second or even third degree.

In the above Kickham is calling attention to conditions in a fairly normal type of case, in which ordinarily we are chagrined to get more than a first-degree tear, and he asks, how can we prevent this increase in extent of perineal laceration by the shoulders?

This is best done by remembering the anatomical relations and normal mechanism of labor, and above all slow careful delivery of the shoulders, ever remembering that careful delivery of the head is only one stage in the operation and that the body to follow is worthy of the same care in delivery.

After external restitution of the head has taken place, with the preceding rotation of the shoulders, firm but gentle traction downward on the head, assuming a lithotomy position, will sink the posterior shoulder backward and slightly upward in the vagina and simultaneously bring the anterior shoulder under the pubic arch; at this time rapidity of delivery is rarely necessary, and care can be taken by frequent observation to see if undue pressure is made on the perineum and if the anterior shoulder is molding into place under the pubes. Assuming that the latter is taking place, then traction outward, with a gradual upward swing, will deliver the anterior shoulder from under the arch and thus markedly increase the room for the posterior shoulder; traction now continued upward in the curve of Carus will complete the delivery of the baby. In certain

cases the shoulders, either due to abnormal size or to some other abnormality, will become impacted and are difficult to dislodge. In these cases all traction should still be gentle, and the fingers of one hand inserted into the vagina, and if anteroposterior position is present, by pressure on the shoulders thus be converted into an oblique position and delivery facilitated; if an oblique position, disengage if possible by direct shoulder pressure and rotate slightly, and by virtue of disengagement of the impaction delivery may then be fairly easy. If the impaction persists, then we must be governed by the circumstances, with the cardinal principles adhered to of gentle though firm manipulation and remembrance of dangers not only to the child's bony and nervous tissues but the perineum and vaginal tissues of the mother.

Intravenous Injection of Camphor.

The *Lancet* of December 1, 1923, in referring to this subject in its "Annotations," states that camphor as a circulatory stimulant is in much greater esteem on the continent than in England. Subcutaneous injections have long been used, especially for children, but it is only recently that it has been shown that camphor oil can with impunity be injected directly into the circulation, and that the reaction is immediate. The stimulating effect on the circulation of camphor oil given intravenously has recently been emphasized by Schilling of Küchwald, in Chemnitz. Schilling has used camphor in this way in all cases of marked collapse. In particular has he found it useful in cases of poisoning, his material comprising some 45 cases. It is especially indicated in coma following gas-poisoning, as illustrated by the following case:

A girl was brought in who had lain for three to four hours in an atmosphere of gas. She was completely unconscious, and reacted only slightly to stimulation of the skin. Three minutes after injection of 1 cc camphor oil she opened her eyes, sat up, asked where she was, and answered clearly all questions put to her. In only four cases, two of morphia and two of gas-poisoning, was no effect obtained with camphor. Even if it is granted that the majority of cases of gas-poisoning recover without any treatment, yet from Schilling's experience it is clear that consciousness returns much sooner after the use of camphor, and thereby the danger of inspiration pneumonia is considerably decreased. Although consciousness is usually regained after the first injection, in severe cases the treatment may have to be repeated two or three times at intervals of six hours.

[We would fear the effect of injecting an oil intravenously.—ED.]

The Prevention and Relief of Heart Disease.

EWING, in the *Journal of the Medical Society of New Jersey* for December, 1923, quotes Emerson as summarizing the steps involved in prevention as follows:

1. Control of infectious diseases, particularly rheumatism and syphilis.
2. Care of teeth, tonsils, and adenoids.
3. Lengthening of the period of hospital stay and convalescent care after acute infections, particularly after rheumatism and tonsillitis. (This is difficult in many cases because of shortage of beds.)
4. Supervision of home after-care, preferably from a special cardiac class in a dispensary.
5. More regard for "growing pains" in children, commonly found to be of infectious or inflammatory origin, and their importance often overlooked.
6. Supervision of nutritional defects.
7. Avoidance of mid-age overexertion, habits, intoxications, etc.

Prevention of decompensation may well come under this heading. It is really the prevention of serious heart break-down and is important. Prevention of heart overstrain in those with a recognized heart defect is an important service of special cardiac clinic for adults.

It is also important in children coming to the age when they must take up some employment or plan future study looking toward their life-work. To these should

be added graded and supervised systems of exercise, which do much to improve the general nutrition of the patient and to increase his cardiac reserve.

Minute attention to detail is the key-note of success in dealing with cardiac disease, it being necessary to inquire into and supervise every part of the individual's life and to do it systematically, regularly, and persistently, no matter how well he may be, for only by so doing can repeated breakdowns and ultimate invalidism be avoided.

In closing Ewing lays emphasis on the following points:

The magnitude and seriousness of the menace of heart disease.

The need of careful, painstaking, sympathetic study of these patients and proper treatment, looking to the arrest of their disease.

Their rational classification.

Fitting them into the niche in the social structure where they can be of the greatest use, without harming themselves.

Careful, detailed lifelong supervision. No patient with cardiac damage is so well that he does not need the oversight of a physician.

Do not wait for a cardiac case to develop symptoms of heart failure before you begin to take an interest in him, any more than you would wait for hectic fever, emaciation or hemoptysis before beginning treatment in a case of pulmonary tuberculosis.

Surgical and Genito-Urinary Therapeutics

Marriage, Pregnancy, Parturition, and Tuberculosis.

WARD *(Lancet,* Sept. 15, 1923) considers the risk if a tuberculous woman should marry, to herself, her children, or her husband. Osler writes: "Child-bearing increases the risks from tuberculosis enormously." There are a number of experienced practitioners who believe that marriage and child-bearing always benefit tuberculous women.

Ward for three years has been collecting evidence of the risk of matrimony to tuberculous women. Only major tuberculosis was considered. The effect of marriage alone on 125 tuberculous women was: 60 per cent were unaffected, 26 per cent bettered, 14 per cent were made worse. From which, bearing in mind the fact that 15 to 20 per cent of patients may be expected to deteriorate in any period of one or two years, we must conclude that marriage has, if anything, a beneficial effect on tuberculosis.

Out of 423 pregnancies in 237 women, 53 per cent had no effect, 16 per cent improved the patients, 31 per cent made them worse. The clinical onset of disease occurred during pregnancy in about 4 per cent of women, and of these less than half terminated fatally. Some cases are remarkably improved by pregnancy, others go to pieces, but about 70 per cent are bettered or unaffected. Unluckily it is impossible to consider pregnancy apart from parturition.

Out of 442 labors in 240 patients, 32 per cent left the patient unaffected, 19 per cent made her better, and 49 per cent made her worse.

The onset of disease occurred after parturition in 17 per cent of patients, of whom nearly one-half died. If we add the pregnancy onsets it gives us 21 per cent. Apart from these onset cases, which naturally attract notice, and have considerably influenced writers on the subject, only 2 per cent of women died as the direct result of an exacerbation caused by child-bearing; so that parturition is likely to make preëxisting tuberculosis worse, but unlikely to make it fatally so. The worst are the onset cases, which cannot be foreseen. Yet there are instances (19 per cent) where parturi-

tion has a beneficial influence, sometimes strikingly so. A patient with chronic phthisis, almost an invalid, may suddenly pick up after the first baby, and become the mother of a large family. Sometimes we find a patient better during pregnancy, worse after confinment, less often the reverse; the patient goes downhill rapidly during pregnancy, but picks up wonderfully afterwards, although she has to look after a child. We must not underrate the mental factor in these conditions. A study of resistance to this disease in pregnancy, and after childbirth, may yet throw welcome light on the mechanism of immunity.

As to the result of miscarriages, Ward has investigated but 31 of these. In 47 per cent there was no effect, 3 per cent were improved, and 50 per cent were made worse. The onset occurred after the miscarriage in four of these women (12.5 per cent), of whom one-half died. The value of induced abortion in tuberculous women seems very questionable.

As to lactation, out of 331 cases investigated, in 197 the mother breast-fed the child for a period from a few weeks to over three years, but in only 2 to 3 per cent did lactation appear definitely to cause deterioration. The patient became gradually worse, long after parturition, but before lactation ceased. A woman too ill to suckle is generally unable to do so. Lactation may be exhausting, but it may prove even more exhausting to get up at night to heat bottles and to deal with a child made more fretful, perhaps, by artificial feeding. And the amount of nourishment withdrawn in the first six weeks is not large. There are also other more subtle considerations.

Of the offspring from the labors already considered, 372 were traced and 290 investigated personally. Of these 45 per cent were negative; 34 per cent were tuberculous, of whom one-quarter died of the disease; 21 per cent were suspect. Among the children unexamined by the author 42 per cent were dead from causes unknown or other than tuberculosis. He includes with these most cases in which the death of infants was attributed to "consumptive bowels." Compare with this the examination of 82 controls—that is, contacts of non-tuberculous persons; 87 per cent of these were negative, 5 per cent tuberculous, 8 per cent suspect.

Out of 177 children breast-fed by tuberculous mothers, 35 per cent were negative, 31 per cent tuberculous, of whom one-fifth died, 15 per cent were suspect, 15 per cent were unseen by the author, and 4 per cent dead from causes unknown. Among 116 bottle-fed children 32 per cent were negative, 25 per cent tuberculous, of whom one-fifth died, 14 per cent suspect, 14 per cent unseen by the author, and 15 per cent dead from unknown causes. There are pitfalls, no doubt, but on the whole the increased risk to the child from breast-feeding under these circumstances seems negligible.

As concerns the husband it is certain that he will be infected sooner or later, if not congenitally immune or with a smouldering infection of his own.

Summing up, we find that a tuberculous woman loses nothing by marriage alone. It is unlikely to affect her either way; if it does affect her it is more than twice as likely to improve her condition as to cause deterioration. Pregnancy and parturition are likely to make her worse; there is, however, only a 50-per-cent chance of this against a 19 per cent chance of improvement. But the children are seven times as likely to be tuberculous as those of healthy people.

As to the advice which may be given to a patient about to marry: patients who ask for such advice will not take it unless it coincides with their wishes. If the doctor says "Do not marry," and consciously, or subconsciously, the young couple are anxious not to marry, they may abide by his decision, but not otherwise. Often enough the only result of such advice is a more hasty marriage. The best way to prevent an undesirable union is to procrastinate. The advice should be "wait," expressed in as many words as may be considered appropriate to the occasion. Each

case must, of course, be considered on its merits from all points of view. The author's figures, moreover, apply only to the poorer classes. He is now making an attempt to secure figures from better class patients.

To relatives percentages may be given. The chief risk is to the children, and this should be emphasized. A woman of marriageable age with major tuberculosis should not bear children. To counterbalance the loss of gratification of the maternal instinct must also be placed the risks of deterioration to the patient. Finally as to lactation: If milk is available it is wise for a tuberculous woman to breast-feed the child for six weeks certainly, longer in many cases, but never longer than eight months, and always with precautions if she is infective.

Is it possible to estimate the risks of a tuberculous inheritance as contrasted with the risks of infection by a comparison of the children of closed surgical and open pulmonary cases? If Piery's observation be confirmed, that the sweat of patients with closed surgical tuberculosis gives positive inoculation results in guinea-pigs in 30 per cent of cases, the difficulties will be well-nigh insuperable.

Diagnosis and Treatment of Brain Tumors.

DANDY (*Wisconsin Medical Journal*, September, 1913) holds that in the treatment of brain tumors two factors are all-important—*i.e.*, accurate and early diagnosis and efficient operative procedure. Concerning the accurate diagnosis the difficulty lies in adequate localization.

For many years it has been possible to know that a patient was afflicted with a tumor, but we have not been able to tell where it was located. With such inadequate information, it is clear that operative results must be very poor. So discouraging have been explorations for tumors of the brain that, except when the location of the tumor seems clear, the palliative decompressive operation has become more or less routine. Obviously, such treatment is most unsatisfactory. There is only one way to cure a patient with a brain tumor, and that is by a complete extirpation of the growth by operation. Decompressions have been justifiable only because the location of the tumor has been unknown. If the location of the tumor is known, any treatment which delays or is palliative is no more justifiable than delay or palliation in appendicitis.

Although the rate of growth of brain tumors is variable, a fatal outcome is almost inevitable. But we have many warnings of this impending calamity. Tumors cause headache, destroy vision, produce paralyses, convulsions, speech and mental and other disturbances, and most of those changes are progressive. The great hope for patients afflicted with brain tumors lies in the earliest possible diagnosis. To do this, it is incumbent upon us to suspect a tumor when any symptom or sign referable to the central nervous system makes its appearance. Fortunately, it is now possible by the use of cerebral pneumography—*i.e.*, roentgenography of the brain after the injection of air into its ventricles or subarachnoid spaces—to diagnose and also to localize practically all brain tumors which cause pressure, and in the early stages of the tumor's growth. This being possible, the problem of handling brain tumors is greatly simplified.

The treatment of tumors is now reduced to a single simple formula: complete extirpation when the nature and location of the growth make this possible; and when impossible of removal, then and only then to produce the maximum decompression for palliation. Unfortunately, some brain tumors, by virtue of their infiltrating character, do not permit extirpation. In other instances, removal is precluded because of the invasion of the brain-stem, speech centers, or other vital parts of the brain. There are, however, many non-encapsulated growths in silent areas of the brain which, if detected early, can be completely re-

moved. The so-called silent areas of the brain were formerly the greatest handicaps to cerebral surgery because they prevented diagnosis of localization of the growths owing to the absence of signs or symptoms. Formerly it was necessary to perform palliative operations until the tumor grew beyond the confines of the silent brain and produced paralyses or other focal destructions of the contiguous brain with recognizable functions. Now these silent areas are the greatest assets for the success of brain surgery; for the localization now being possible in another way, extirpation of the growth can be done with contiguous silent areas of the brain, when necessary, and still leave the patient without noticeable defects.

Brain tumors give rise to two types of signs and symptoms: (1) localizing symptoms and (2) general pressure symptoms. If the former are present, the localization is automatically made. Their consideration need not detain us. But the overwhelming proportion of the brain tumors give rise to so-called pressure symptoms. The craniovertebral chamber is a closed and fixed space and its contents—blood, cerebrospinal fluid, and brain tissue—are almost totally incompressible. For this reason a new growth is tolerated only by a compromise with these intracranial contents, and this compromise gives the warning signs: headache, nausea and vomiting, choked disc, etc.

Probably all brain tumors which produce intracranial pressure, produce (as an expression of this compromise) changes in the size, shape or position of the ventricles and subarachnoid spaces of the brain. If the fluid from these spaces is removed and air substituted in its place, these changes in size, shape and position will be accurately registered in roentgenograms of the head. It is, therefore, clear that if these alterations are known, the location of the cause which produces them (the tumor) can be deduced. In many instances the localizations have been so precise as to permit transcortical incisions of great depth to find the tumor at operation, and often to remove successfully tumors which otherwise could never be found except at necropsy.

The interpretation of the air shadows is difficult and is all-dependent on the intimate knowledge of intracranial anatomy and physiology. Its danger is shown by the fact that Dandy has had three deaths in his first 100 injections. However, in over 400 since then there has been none. Air is an irritant. When the ventricular channels are blocked, its absorption is prevented; a serosanguinous exudate results from its irritation; and this produces a marked accentuation of pressure symptoms. Many patients are so ill that this additional pressure could not be tolerated. To prevent this complication, the air should be removed as soon as possible after the skiagrams are completed. If the quantity of air injected is large (30 cc or more) either the original ventricular fluid or saline solution may be replaced. In safe hands the procedure is now without great danger. It seems inadvisable, at least at the present time, that a risk so great as the use of air requires should be assumed except by a competent neurological surgeon.

Gastromyotomy.

CLARE *(Lancet,* Sept. 22, 1923) in spite of Moynihan's criticism directed against the operation, believes that it is based on sound physiological principles; that it may fairly be described as a safe and simple operation; that the results in the few cases in which it has been performed have been good.

There is some factor in connection with the small curvature and the pylorus that delays or prevents the healing of ulcers near these parts. This factor is to be found in the arrangement of the circular muscle fibers in these parts. It is a fundamental principle of pathology that rest is conducive to the healing of a wound, while movement and irritation hinder healing. While no part of the stomach is at rest for any length of time, unless feeding by the

mouth is discontinued, and probably not even then, an ulcer originating in a part where the muscle fibers are sparsely distributed, such as the great curvature, has a much better chance of healing than one which happens to start in the sphincter of the pylorus or the small curvature. A fissure of the anus involving the sphincter ani heals slowly, perhaps not at all; when the muscle is divided the fissure heals rapidly, in spite of the septic nature of the material that passes over it. It occurred to the writer that treatment on these lines might allow natural healing to take place in chronic ulcers of the stomach, and that it might prove more profitable to focus attention on the muscular fibers rather than on the gastric juice or on dental sepsis. The operation consists of a division of the circular muscle fibers that pass to the neighborhood of the ulcer. "Gastromyotomy" seemed a convenient and self-explanatory name for the operation.

If the ulcer is on the anterior wall of the stomach, a curved incision, about four inches long, with the convexity downward, is made below the ulcer and sufficiently far from it to be free of indurated tissue; this incision divides the peritoneal coat only. The peritoneum is separated from the muscular coat for about a quarter of an inch on each side of the incision, and the muscle fibers are defined. The incision is then carried down to the muscularis mucosæ, thus dividing all the circular muscle fibers passing to the ulcer-bearing area. This part of the operation is a little difficult, as the fibers are sometimes indistinct and it is easy to penetrate the mucous membrane; should this occur it is sutured before proceeding. The divided muscle fibers are now separated on either side of the incision by means of gauze wiping, and the peritoneal coat sutured by Lembert sutures in such a way that the cut edges of the peritoneum are inverted into the gap that has been made in the muscular coat.

In no case has there been any pain after the operation, nor any vomiting, apart from slight postoperative vomiting. In one patient in whom even feeds of milk caused pain up to the day of operation, the pain entirely disappeared and has not recurred, though she has been taking ordinary food with good appetite for some months. This has been perhaps the most striking case, for in the other cases careful dieting and medical treatment combined with rest in bed had relieved the pain for a week or so before operation. In one patient, who was markedly anemic from gastric hemorrhage, the melena which disappeared immediately after the operation recurred, and did not entirely disappear until the twelfth day. In this case the base of the ulcer was very thin and was cauterized and infolded; some leaking apparently occurred and the upper part of the wound suppurated for a few days. There has been no pain or vomiting since the operation, and six months after discharge the melena has not recurred.

Gastromyotomy is the link between medical and surgical treatment; the aim of medical treatment is to encourage healing by diminishing functional activity and so resting the stomach; the operation secures rest by putting out of action for a time the actual muscle fibers whose contractions irritate the ulcer.

Painless Conscious Childbirth.

Cooke (*American Journal of Surgery*, October, 1923) has given 966 spinal analgesias for everything that could be operated on below the diaphragm, this while he was chief anesthetist to Los Angeles County Hospital during 1917-18. On the basis of this he began using this method of anesthesia in obstetrical cases. His technique is as follows: The dry contents of a sterile ampoule of novocaine are poured into an empty, sterile syringe and the plunger pushed down upon it. A spinal needle with obturator inserted is pushed between the vertebræ of the lower lumbar region into arachnoid space until, on withdrawal of obturator, spinal fluid starts to flow. The loaded syringe is attached to the needle and the contents dissolved in spinal fluid, and

the fluid reinjected around the cord. Analgesia starts in less than one minute and is well established in less than five minutes, during which time patient can be put up in stirrups and prepared for delivery. This form of analgesia takes away the senses of pain and temperature, bnt not entirely touch sensation, and interferes with motor control of the muscles involved, thereby securing complete relaxation and desensitization of the entire birth canal.

He reports on 25 cases and gives the time from the nerve blocking to the birth of the baby. He states that a spontaneous case usually delivers inside of two hours. A breech case takes less than fifteen minutes from the time of injection as soon as the foot can be grasped. Version has been accomplished in twenty-seven minutes. He summarized his contribution as follows:

Nature's protective pain sense can be overcome by this method.

The antagonistic functions of the upper and lower uterine segments are apparent.

Each of these tissues is differently innervated.

This method can desensitize and relax the entire birth canal, and thus aid in a painless and an easier delivery.

The uterus is a muscular sac; the upper portion dilates and relaxes while the lower is contracted during pregnancy.

In childbirth these conditions are reversed in active labor, the upper part thickening and contracting, while the lower part is thinned out and forced to relax, to allow the child to pass through the birth canal.

The upper part of the uterus is innervated by the sympathetic system, and its own intrinsic and involuntary nerves.

The lower part and the birth canal are cerebrospinal innervated, which is sensory and motor.

Block off the spinal innervation to this birth canal and we have a shorter, easier labor, with no more pain in spontaneous deliveries than that of defecation; and in mechanical deliveries no effort on the part of the mother is needed, all saving time and distress.

Nerve blocking must be varied to suit the kinds of delivery.

The more pathological the patient's condition the more outstanding is the preference for this method; as in pneumonia and eclampsia cases.

This is the quickest method known to empty the uterus painlessly.

Spinal injection or nerve blocking is painless because the resisting tissues causing the pain have been desensitized by its use and relaxed, and the baby can be much more quickly delivered because the resistance to the contracting fundus has been removed, and the patient is comfortable.

It is a conscious delivery because the body only below the diaphragm has been blocked off; no general anesthetic has been given; the patient can talk, coöperate, and follow directions.

She can have sips of water, coffee, ice, etc., for refreshment, and after delivery can return to bed and eat, as nothing has been done to upset her stomach or hinder digestion, as with ether or chloroform.

This is not a circulatory anesthetic but a nerve inhibitor.

There is no nerve connection between the mother and the baby; and as only the mother's pain sense has been dulled or obliterated, the baby has not been touched by the nerve blocking and it cries as soon as delivered, and we know that the baby will live and has *not* been anesthetized.

We have here a very definite aid to delivery suitable for every known procedure in obstetrics.

The relaxation is complete, and there are no tears due to pain contraction reducing the size of the outlet.

Lacerations, if there are any, are due to abnormality in size of child and would be inevitable with any method, but can be repaired at once without pain.

This method is brought to the attention of the profession in the interest of humanity and of the babies that are yet to come, and for the relief and comfort of the women upon whom the burden of child-bearing is imposed.

Subphrenic Abscess.

NATHER and OCHSNER (*Surgery, Gynecology and Obstetrics*, November, 1923) note that the diagnosis of a subphrenic abscess following appendicitis is easy, if one bears in mind the possibility of its development and is on the lookout for the appearance of a pathological process in the spaces mentioned.

To consider the possible occurrence of a subphrenic abscess in a case of appendicitis the postoperative course of which deviates from the normal is often equivalent to the making of the diagnosis.

As a complication after appendectomy a subphrenic abscess can develop within a few days or it may be weeks after the operation that the first symptoms appear. As a rule the abscess is, within one to two weeks, so far advanced that it can be easily recognized.

Even at the original operation, it is often possible from the findings to predict the probable development of a subphrenic abscess—*i.e.*, a highly located, badly infected appendix; retrocecal or appendiceal abscess; early peritonitis, etc.

When such an abscess develops the general symptoms are the first to be observed. The patient does not recover after the appendectomy. The temperature does not fall as should be expected, or increases without an apparent cause after an afebrile period. There may be an alteration in the pulse-rate without a perceptible temperature change; it does not decrease as it normally should, or it may even increase in frequency. Leucocyte count remains high and may go still higher. The patient has no appetite. Sweating is profuse. Prostration becomes marked. The patient occasionally complains of transitory pains in the upper abdomen or chest.

Superficial examination reveals nothing. Exact, careful palpation of the subphrenic region, flank, and chest reveals finally a distinct painful point upon pressure. This may at first seem very unimportant, but it not only remains constant from day to day but increases in size. The localization at repeated examinations remains the same. One is very apt to notice that the impression made by the finger remains in the skin, a skin edema which is often present. Later the lower lung boundary is found to be immobile. A swelling is not demonstrable either visibly or by palpation. There is dulness over the base of the right lung, which is often incorrectly interpreted as the result of bedridden condition of the patient.

This is the early clinical picture of a subphrenic abscess complicating appendicitis, the single symptoms in themselves seemingly harmless and unimportant, but which considered as a whole constitute a syndrome by means of which it is easy to make a diagnosis.

When there is not the history of a previous appendicitis the diagnosis is naturally more difficult, but even then it usually can be easily made if the case is carefully observed and the above mentioned symptoms and signs made out.

In those few cases in which a diagnosis cannot be reached clinically an exploratory aspiration, as advocated by Beck, must be resorted to. This, however, as with the operation, should not be carried out transpleurally, but should be performed beneath the pleura and diaphragm. The aspirating needle attached to a glass syringe is inserted in the posterior axillary line at the level of the first lumbar spinous process and is directed upward and backward at an angle of less than 45 degrees. Aspiration should be carried out by the insertion of the needle so as to prevent the danger of passing through an abscess and infecting healthy tissues beyond.

In evacuating a subdiaphragmatic abscess they advocate the retroperitoneal method of approach, as follows:

Incision over and down to the twelfth rib to within 4 centimeters of the midline posteriorly. Subperiosteal resection of the entire twelfth rib.

Transverse incision of the musculature below the bed of the resected twelfth rib at the level of the first lumbar spinous pro-

cess, which should be marked before the operation. In this way the pleura will with certainty be avoided. Careful dissection down to the renal fascia, which is recognized as a smooth, shining, fibrous layer. Through it the renal fat can be seen.

If a retrocecal or retroperitoneal abscess is suspected the skin incision can be extended downward and forward in the direction of the anterosuperior iliac spine, the muscles separated in their respective directions, and the retroperitoneal and retrocecal regions explored.

Blunt separation of the musculature from the renal fascia for a short distance above and below the wound. Broad, dull retractors are placed above which elevate the diaphragm and pleura and protect them from injury. Blunt separation by means of the index-finger of the peritoneum above from the under surface of the diaphragm. The peritoneum is found continuous with the renal fascia. This separation is easily accomplished up as far as the dome of the liver, thus enabling one to reach those abscesses located high on the liver surface. If an abscess is present, the peritoneum is markedly edematous and the separation is even more easily carried out. Anatomical studies have shown that if the separating finger follows the direction of the diaphragmatic fibers which run parallel to the ribs, the separation is still easier.

Aspiration of the pleural cavity above the diaphragm in those cases in which an empyema is suspected. This is carried out with a finger in the subphrenic space between the separated peritoneum and the diaphragm, so that one can feel the aspirating needle and prevent its passing through the diaphragm.

Exploration of the subhepatic space by means of the aspirating needle, the point of election lying between the visible right lower border of the liver and the upper pole of the right kidney. If pus is obtained, the needle is withdrawn without opening the abscess and the area tamponaded with gauze until after exploration of suprahepatic space.

Exploration of the suprahepatic space by means of the curved needle which was advocated by Clairmont for exploration of the upper surface of the liver. It must be borne in mind that the favorite site of election for a postappendiceal abscess in the subphrenic region is the right upper posterior space. For this reason it is of practical importance to direct the needle well posteriorly. If pus is obtained, the abscess is opened by breaking through the peritoneum over it by means of the finger. If pus has been obtained by the exploration of the subhepatic space, this abscess is likewise drained. Introduction of large rubber drainage tubes and iodoform gauze drains into the cavities, but no irrigation.

It is possible to explore and drain both a suprahepatic and an infrahepatic abscess by means of one and the same procedure.

There is no danger of contaminating an unaffected pleura or peritoneum. By the transpleural approach, even though one uses the various operative procedures to shut off and protect the free pleural cavity, such as suturing the diaphragm to the pleura, etc., there is always danger of a resulting empyema. Grueneisen found that in 28 per cent of subphrenic abscesses opened through a normal pleura and in 35 per cent of cases in which there existed sterile fibrinous adhesions, empyema developed in spite of the various operative procedures employed to protect the pleura. Perutz in 67 per cent and Piquands in 78 per cent of cases of subphrenic abscesses found the pleura unaffected. To avoid the pleura when draining a subphrenic abscess is of utmost importance, because in 75 per cent of cases (Nather) the pleura is sterile. For practical purposes we can consider the pleural cavity sterile in all cases of abscesses in the subphrenic region, even in those cases in which there is present a pleural exudate or fibrinous adhesions.

An important surgical advantage is that the abscess is drained in its most dependent portion.

By simple extension of the incision downward and forward, it is possible to explore the retroperitoneal, retrocecal and perinephritic spaces. In combination with the

preperitoneal operation (Clairmont-Nather) the entire subphrenic region can be drained.

There is less shock associated with the retroperitoneal operation than with the transpleural, as only one body cavity is opened.

Management of Acute Brain Injuries.

MELAND *(Minnesota Medicine*, November, 1923) notes that when a patient is brought in with an acute brain injury the surgeon is confronted with two questions: What and where is the lesion? And what is the proper mode of treatment? The picture presented may vary from a slight restlessness with headache, unconsciousness with a slow hard pulse, deep regular respiration, and subnormal temperature, to unconsciousness with a small running pulse of low tension, and a cold clammy skin, a high temperature, and a shallow, rapid respiration. Inasmuch as the brain is easily compressible and lying within a rigid cavity, the various phenomena which take place are pressure phenomena. The degree of pressure accounts for the type of symptom-complex presented.

The earliest experimental work was done on the human subject by Boerhave in 1712. At that time there was a beggar in the streets of Paris who had lost a portion of his skull, leaving his brain protected only by the dura mater. For a few centimes he permitted Boerhave to note the effects of pressure. Boerhave found that by gentle pressure with his finger, the beggar seemed to see a thousand stars before his eyes; and upon pressing still more forcibly, his eyes lost all their sight; and by pressing still more strongly on the dura mater, he fell in a deep sleep, which was attended with all symptoms of a slight apoplexy. When the pressure of the hand was removed he gradually recovered from the symptoms as they were brought on, the apoplectic symptoms first vanishing, then the lethargy, and lastly the blindness, so that all his senses recovered their former perfection. This actual experiment on the human being is of interest as it is analogous to what happens in animals on experimental pressures. Von Leyden found that a pressure of 50 mm. of mercury produced pain and restlessness, which he ascribes to irritation of the dura, while unconsciousness appeared at 130 mm. Slowing of pulse was sometimes noted at 5 mm., and was constant at 75 mm.; this slowness continued up to 150 mm., while above this it became smaller and more irregular the higher the pressure. The pupils dilated only on high pressure. Von Schulten proved that as the compressing force increased the blood-pressure increased. This he ascribed to the action of the pressure on the vasometer center in the medulla; this phenomenon keeping on until exhaustion of the center takes place, when the blood-pressure drops and death results. This he termed the life and death struggle.

The brain reacts to trauma in the same way as the other tissues where the blood-vessels have been torn. If the injury is mild, only a small amount of serum is poured out, separating the cells and causing a localized edema; if it is severe, there is a tearing of the capillaries and smaller vessels with subsequent hemorrhage into the pia and arachnoid spaces; while in severe cases there is laceration of the brain tissue with hemorrhages into the brain substance. Apfelback says that, aside from the lacerations occurring at the time of injury, most bruises come as a result of the tearing of and the bleeding from the pial arteries between the gray and white material. The blood, if excessive, dissects its way out through the friable gray substance toward the periphery. In any injury, from the mildest to the most severe, there is therefore a disturbance of the circulation in such a way that the delicate strands of tissue surrounding the Pacchionian bodies and supracortical veins are destroyed; the cerebrospinal fluid is not absorbed; and, as the choroid plexus continues to secrete, the normal flow of fluid across the cortex is interfered with, and it accumulates at the base of the brain in the cisterns. A vicious circle is then set up, for the arteries keep carrying blood in, and the exuded blood mixing with the increasing cerebrospinal

fluid adds insult to insult. Intracranial pressure increases; the tissue becomes water-logged; cerebral edema takes place; and a condition is produced which simulates the picture seen in the experimental animal—cerebral and medullary irritability followed by compression and collapse.

Translated into clinical observations, then, we have the changes that manifest themselves as symptoms which are due to pressure changes in two portions of the brain—the one cerebral, the other medullary. They are first irritative or stimulating and then depressing. Mild changes show themselves in the cerebrum only as sensory, motor or memory phenomena; that is, the patient complains of headache; he is restless, irritable and irrational, and if the injury is over the motor area there will be paralysis, but with no particular disturbance of pulse, respiration or temperature indicative of medullary change. In greater pressures, the cerebral centers are put out of commission, for consciousness is lost and the medulla is affected. At first the pressure is stimulating, for the pulse becomes slow, the blood-pressure rises, and the respiration deepens, all pointing to stimulation of the vagus, vasomotor and respiratory centers respectively. If the pressure increases from further accumulation of extravasated blood and fluid, the pressure becomes depressant, for the centers in the medulla collapse; the pulse becomes rapid, small, irregular; the blood-pressure drops; the respiration becomes shallow and rapid, while the temperature climbs high as death supervenes, for the life and death struggle in the medulla has been enacted. This is the regular order of procedure, termed the stages of compression and collapse.

To the picture presented above must be added the one that is seen soon after an injury. The pulse is rapid, respiration shallow, blood-pressure low, and the temperature subnormal, with a cold clammy skin usually associated with unconsciousness. This is due to the sudden overwhelming stimulation of the medullary centers and is shock. If the injury is located in the occiput or on the base in the posterior cerebral fossa, the patient may not go through the regular steps pointing to compression, but go directly over into the stage of collapse with early death.

If now a patient comes in with an injury to the brain, what is the correct treatment? Shall it be expectant or shall it be one of interference, and if so, what type? These questions can be answered by keeping in mind the results of the animal experiments and by observing the various symptoms that point to what is going on in the cranial cavity. The surgeon must also consider that the purpose of the treatment he institutes must be twofold: (1) to save life; (2) to prevent that train of symptoms occurring in the patient which are termed the traumatic neurosis, and which are manifested by headaches, dizziness, nervousness, convulsions, etc., conditions that will produce an individual who leads a vegetative existence rather than one who can be a wage-earner. The one form aims to protect the medullary centers, while the other is concerned over the cerebral centers. A careful examination, together with a lumbar puncture, will reveal this, for it will show the degree of pressure and the probable location of the lesion.

Patients who show only cerebral symptoms without unconsciousness, but who are restless, irritable, and semistuporous, complaining of headache, belong to the class of expectant treatment. If, however, the spinal fluid is bloody and under higher pressure than the normal seven to nine millimeters, then puncture should be repeated until the decrease of symptoms takes place; but if symptoms increase and the spinal pressure steadily mounts, then operation should be resorted to. In all cases in which the patient is unconscious and presents either the picture of shock or collapse, it is the policy of wisdom to defer any radical treatment. In both of these stages any manipulation will hasten exitus rather than delay it, and at the same time bring operative treatment of brain injuries into disrepute. To give the individual the

best possible chance, the one in shock should be given shock treatment by lowering the head, applying external heat, and giving warm coffee enemata. When the stage of shock has passed and the stage of compression commences with its slow pulse, rising blood-pressure, and slow, deep respiration, then lumbar puncture should be done to ascertain the degree of pressure, and if necessary an operation should be practiced.

Patients in whom no depressed fractures are found, and who show the characteristic symptomatology of compression, should be decompressed. If symptoms point to a definite locality, such as over the motor cortex, resulting in paralysis, the opening should be over that point to evacuate any blood clot present, but if there are no localizing symptoms a subtemporal decompression is the operation of choice, opening of the dura widely by a cross-incision. In increasing pressures the dura is tense, sometimes bluish in color, and has lost its pulsation because of cerebrospinal fluid and blood which has filled up the subarachnoid space. On making the opening the fluid spurts out five to twelve inches and the cortex begins to pulsate. Usually the brain looks water-soaked and presses into the decompression opening; therefore the opening should be at least one and one-half to two inches in diameter, or otherwise the operation defeats itself. A rubber drain is inserted and the muscles sutured over the defect. This allows a continuous drainage of spinal fluid into the soft tissues until nature can readjust herself and care for it normally.

In patients with depressed fractures accompanied by incised or lacerated wounds, the obvious treatment is exploration. This exploration should be not only for the purpose of wound excision but enable the surgeon to lift up or remove any bone fragments or foreign material driven into the brain substance through the dura. However, one should not wait until urgent symptoms appear since these may be late in coming. The earlier this is carried out, the better, for it prevents infection and pressure on the underlying brain substance. The mode of procedure should follow the technique described by Cushing.

Of late there has been a tendency to treat many of the brain injuries by lumbar puncture alone. Jackson is a strong advocate of this method and he presents a large series of cases that is very convincing. He resorts to operation only when absolutely necessary. In over 1000 punctures he has had no untoward effects. That lumbar puncture is not without danger is shown by a case reported by Archibald.

Medicolegal and Obstetrical Observations on Scopolamine Anesthesia.

House (*American Journal of Surgery*, October, 1923) holds that morphine inhibits the progress of scopolamine anesthesia in obstetrics. The former drug is entirely unnecessary, and indeed is contraindicated when combined with scopolamine. The method of administration of scopolamine is as follows and is described as the Florence-Rosser method:

When dilatation is manifested gr. 1/130 scopolamine plus apomorphine gr. 1/50 to 1/60 are given. If pains are fast, wait for the duration of fifteen minutes; if pains are slow, wait twenty or thirty minutes to inject scopolamine grain 1/200. Chloroform is then administered, the patient being directed to count during inhalations, which are continued until the patient can no longer count. When the chloroform is removed the patient passes into the stage called amnesia. If the stage of amnesia is not satisfactory the chloroform is again administered and the patient asked to count. The number reached tells the condition of the mind and guides the selection of the next dose of scopolamine.

The small amount of chloroform required and the intervals between its use makes it a minor issue. The baby will be as drowsy as the mother. To prevent the blue baby one-eightieth of a grain of strychnine sulphate is injected into the abdominal muscles of the expectant mother five minutes before delivery is anticipated. When the

head passes over the perineum a few inhalations of choloform are again given. Scopolamine grain 1/60 is the limit of safety.

Bearing on scopolamine anesthesia and criminology House regards this as a harmless humane third-degree method of securing from the mind against its will the stored contents called memory. Perhaps it is with this thought the drug has been called by Ferguson "truth serum." House offers the following conclusions as being possible of attainment:

The principle involved in the use of scopolamine in this direction is based upon recognized physiological functions of the brain and these clinical observations. The brain's most powerful center is hearing. It is the last center to succumb to an anesthetic and the first to function after discontinuance of an anesthetic. The center of hearing can, and does, make the other four centers function before these centers are influenced by their own special nerves.

The only function the auditory nerve possesses, when stimulated by a question, is to carry sound waves to the auditory center, and the only function the auditory center has is to evoke memory.

Under the influence of scopolamine as advised, a criminal is rendered oblivious to existence; appreciation of environment is eliminated. The will power is non-existent. In such a state of unconsciousness, if subjects are engaged in conversation, the moment they can hear, at the moment the auditory center asserts its power, there need then be no doubt that their reply will be the truth. They are too helpless to protect themselves by inventing lies to questions propounded.

In the House *receptive stage* the answer to a question is the product of cerebral integration, and is not due to impressions stored away in isolated places. Make a subject correctly interpret, in the auditory center, the meaning to a question, and the answer comes from stimulation of that part of the brain where memory can be produced. It is, therefore, important in the use of scopolamine in criminological practice to exercise caution and patience; also to have experience in promptly framing the question. Subjects will forget the first part of a question unless the query is presented in a short, concise manner, representing the thought to be transferred, in the fewest possible words. All questions should be presented at least three different times for corroboration.

Any person arrested as a suspect can be made to acquit or convict himself.

There would be no further necessity to grant immunity to a known criminal, for the reason his evidence could be obtained and corroborated without his consent.

A perjurer, at the command of the judge, could be made to tell the facts as they exist in his mind—in other words the truth.

In times of war a spy could be made to divulge his information before being tried.

Statistics say that only one person in ten who are tried is convicted. The nine who escape from lack of evidence would show under the influence of the drug those who were guilty.

Statistics show that one-third of the arrests are a mistake. It is from this class that the innocent in the penitentiary are recruited.

Statistics compiled give over one-half of the expense for maintaining our government as being spent for the control of crime. If Uncle Sam could prove this theory, in the hands of trained men, as reliable, it would mean the saving of millions of dollars a year.

Its adoption as legal, to be used only by criminal investigators, would do more than any one method to prevent gang robbery. Criminals would soon learn the arrest of any one of them would mean the names of all of them.

It would do more than any other type of third degree to obtain confessions. For this very reason many would prefer to confess than to take the medicine.

Statistics say that there are five per cent of innocent persons in every penitentiary. If this method could be standardized it would clean every penitentiary of their innocent, and furthermore there would be no more innocent persons sent there.

Glaucoma.

HAWKER (*Lancet*, Oct. 13, 1923) observes that the condition of increased ocular pressure, known as glaucoma, is a nightmare to some practitioners, whilst others miss it even when the signs are plain.

When seeing a patient with violent headache and neuralgia over the region of the distribution of the fifth nerve, vomiting, mental disturbance, irregular pulse, and mists or light flashes (frequently colored) in front of the eyes, refrain from diagnosing influenza or a bilious attack, for unless prompt and adequate treatment be employed the sight will be rapidly lost and the eye disorganized. Again, in an elderly person complaining of a gradual loss of sight, do not diagnose cataract until you have looked at the pupil area for the fundus reflex with a reflected light; even then, if the area is largely filled with striæ or other opacities, it should be remembered that glaucoma is often associated with cataract, or the lens opacities may be secondary to a chronic glaucoma from interference in its nutrition arising from increased pressure. In either case an oculist should examine the patient while the fundus can still be seen, in order to determine the necessary treatment.

The signs of acute glaucoma frequently merge from those of the more chronic type into the eruptive stage. There are often complaints of the prodromal symptoms of transient mists in front of the eye for a moment, rainbow halos round lights, neuralgic headaches and loss of near sight, especially in the hypermetrope; these are often the only symptoms in the chronic insidious type of the disease. The acute attack may be precipitated by any extra strain, such as a big meal, too much alcohol, mental or physical overwork, or some illness. The chief symptoms have been already given; the vision fails rapidly and in a few hours only hand-movements may be detected. The lids are puffy, and the conjunctiva, both palpebral and ocular, is dusky red from venous congestion; the cornea is steamy and may be insensitive to touch or acutely tender; the anterior chamber is shallow and the iris muddy, with pupil moderately dilated, often oval with the long axis vertical, and not reacting. The deeper parts are not visible, but with the fingers the eyeball feels tense and tender on pressure. In acute iritis the onset is not so sudden; the pupil is small and may be irregular, the anterior chamber not so shallow and the cornea not so steamy.

There is intolerance to light in both conditions, as well as in acute conjunctivitis, from which they must be distinguished. Thus a good light is essential, notwithstanding the patient's protests. If necessary a drop of 4-per-cent cocaine may be used, which will also help by dilating the pupil if the diagnosis lies between glaucoma and iritis.

Acute glaucoma having been diagnosed urgent steps are necessary. Instil eserine drops, 4 grains to the ounce, half a dozen times in an hour, giving one drop in the other eye also. Moist or dry heat should be applied, leeches to the temple, and the patient prepared for an anesthetic. If in a couple of hours there is not a distinct fall in tension and a contracted pupil, iridectomy must be done.

Major Urological Surgery Under Sacral and Parasacral Anesthesia.

LOWSLEY (*Surgery, Gynecology and Obstetrics*, November, 1923) thus describes his method of anesthetization:

The patient is prepared for operation in the usual manner as regards purgation enemata, etc. One hour before going to the operating room an opium suppository (gr. j) is inserted into the rectum. Just as he starts for the operating room he is given a hypodermic of 7 minims of Magendie's solution. Upon arrival he is placed upon his elbows and knees or upon his abdomen on the table. The skin, first having been sterilized in the usual manner, is infiltrated at the point where the needle is to be inserted.

The operator then palpates the coccyx, and sliding his finger above this bone

reaches the lower part of the sacrum, and is usually able to feel the sacral hiatus without difficulty. The sacral horns adorn the lateral borders of a triangle of which the hiatus is the apex. A 6-inch needle is inserted through the anesthetized skin and into the sacral canal by puncturing the ligament which covers its lower end. After penetrating this ligament the needle is easily pushed in 1½ to 2 inches. It has to be guided carefully, otherwise it will impinge on bone and, of course, be deflected. One learns to tell by the ease with which the needle passes and the direction it takes whether it is in the canal. One of the directions the needle may take is just over and to one side of the roof of the canal. This error is detected by the direction of the needle and the fact that it passes with difficulty. One can also check up on this position, if improperly inserted, by the fact that as soon as the injection is started the tissue at the end of the needle will infiltrate with the solution.

The needle having been inserted into the canal, one observes its end carefully to see whether either blood or spinal fluid runs out. In the event of this complication the needle is withdrawn to a point where it ceases to appear and the injection made. If the solution runs easily one is sure that he is in the canal. If, however, the injection is made with difficulty one is quite sure that the needle is not in the canal.

Lowsley injects into the canal 30 cubic centimeters of freshly prepared 2-per-cent novocaine solution without the addition of sodium bicarbonate.

In this procedure one may safely use a quantity up to 60 cubic centimeters provided the solution is not toxic. Thereafter there is injected a one-per-cent solution of novocaine into the first, second and third sacral foramina on each side in accordance with the method of Labat. The foramina are located rather easily by passing the needle into the depression just below the transverse processes and by pointing it mesially and slightly upward. From 5 to 10 cubic centimeters of one-per-cent novocaine solution is injected into each foramen, the needle being withdrawn in order to distribute it in the entire length of the foramen.

The patient is then placed on his back, and twenty minutes by the clock is allowed to elapse before the operation is begun. By this time that part of the patient which sits on a saddle, including scrotum, urethra, and bladder, should be thoroughly anesthetized.

By starting to operate too soon the patient will often feel pain, and such an apprehensive state of mind will be produced that every movement will cause complaint. On the other hand, if one waits until a thorough anesthesia occurs, the patient goes through operation without a protest.

In the seventy thoroughly successful cases the operation apparently passed by unnoticed, except in a few instances in which the patient stated that there was no pain but he could feel a pulling sensation. Three or four of the patients actually dozed off during the operation. An important observation is that the bleeding during prostatecomy, which is fairly profuse by every method, is much less than that noted when gas-oxygen anesthesia is used, due presumably to the fact that the blood-pressure is not nearly so high when the patient is under sacral anesthesia. The anesthesia seems to be deepest in about thirty minutes and continues to be entirely satisfactory for two hours after injection. Dr. Parker Syms makes it a practice to wait for about an hour before beginning to operate. He believes that the anesthesia lasts for several hours. In none of a series of cases observed has the blood-pressure dropped below 100 millimeters mercury, and all of them have shown a tendency to rise at the danger period, about six hours after operation.

The general appearance of the patients on the day following operation by this method is surprisingly good, and it would seem that the shock to the entire body mechanism is very considerably reduced by avoiding inhaling anesthesia.

There have been no late developments such as headache, paralysis, or other alarming effects.

Reviews

APPLIED PATHOLOGY IN DISEASES OF THE NOSE, THROAT, AND EARS. By Joseph C. Beck, M.D., F.A.C.S. Illustrated. The C. V. Moseby Company, St. Louis, 1923. Price $7.50.

In addition to no less than 268 black-and-white illustrations in the space of 280 pages, including the index, we find in this book two excellent colored plates. The author points out that there is no English text-book devoted to the pathology of the parts which he has studied, although an Austrian publication, which is an atlas, he understands will shortly appear in the German language, and the author intends to translate its text into English.

It has been the endeavor of the author not to discuss the literature of the entire subject, but to limit the text almost exclusively to his personal experience, and therefore, as he well says, he does not claim that the volume should be considered as a text-book. As a matter of fact, however, it can be very properly placed in the hands of any special student of diseases in those parts with great advantage. Indeed we do not see how any undergraduate, or graduate, student can get a correct conception of the conditions with which he is dealing without perusing the contents of this very well printed volume. Although its title does not indicate the fact, nevertheless a considerable amount of information is given in regard to the clinical manifestations of lesions in these parts, and much apparatus is pictured as indicating the manner in which the author treats these patients. We note with interest his applications of cocaine, apothesine, and adrenalin locally, and he tells us that in acute rhinitis he has found that after the use of mild antiseptic alkaline solutions or normal saline, which should be warmed, silvol or neosilvol in 5- to 20-per-cent solutions are found valuable.

We wish to reiterate the point that we have just made, that the book gives many valuable points as to diagnosis and treatment, and the author expresses his views so emphatically that there is no difficulty in determining what his opinions are as to what should be done. Thus under a discussion on ethmoid disease, he points out that surgical interference of the ethmoid labyrinth in acute conditions is dangerous, because of the danger of infection through the cribriform plate and the perineural lymph spaces of the olfactory filaments. These cells, if the infection is fulminant, can be attacked through the transorbital route. So, too, he warns against surgical interference in trouble with the posterior ethmoid or sphenoid cells, except under special circumstances.

From time to time in the text the illustrations show the ingenious way in which the author utilizes ordinary things in treatment, as, for example, the use of a thermos bottle, whereby a solution can be kept warm for nasal spray or for irrigation purposes.

INTERNATIONAL CLINICS. A quarterly of illustrated clinical lectures and especially prepared original articles. Volume I, 34th series. The J. B. Lippincott Company, Philadelphia, 1924.

Amongst the lectures we find in this volume is one upon Exophthalmic Goitre by Dr. Barker of Baltimore; another upon Heart Disease in Children and Acute Nephritis by Dr. Griffith of Philadelphia; and a third upon Essential Hemorrhagic Purpura by Dr. Brill of New York. There is also a symposium upon Diseases of the New-born by five authors in the city of Washington, with articles on Diagnosis and Treatment of Pelvic Conditions by Dr. John G. Clark, one upon the Treatment of Some Aspects of Migraine by Dr. Gordon of Montreal. Then follow departments devoted to Rectal Diseases and Industrial Medicine.

The volume closes with the Mütter Lecture of the College of Physicians of Philadelphia by Dr. Sweet, and some forty pages concerning the Progress of Medicine for 1923 by the editors, Dr. Cattell and Dr. Hitchens.

As to the treatment of migraine, Dr. Gordon has found no better remedy than Sir Lauder Brunton's recipe of 15 grains of sodium salicylate and 30 grains of potassium bromide given at the first sign that the pain is coming, repeated when necessary. So too in some cases a cup of strong black coffee seems to give relief.

LES FERMENTS DES LEUCOCYTES EN PHYSIOLOGIE, PATHOLOGIE ET THÉRAPEUTIQUE GÉNÉRALES. By Noël Fiessinger, M.D. Préface de M. le Professeur Chauffard. Mason et Cie, Paris, 1923.

Day by day it seems the importance of the leukocytes in biologic processes is growing. That they take part in inflammation has of course been known for a long time, although their precise function—or functions—is still largely a matter of speculation. Their significance extends, however, beyond inflammatory processes, beyond phagocytosis. They are known to elaborate a variety of ferments which play an important rôle in physiological and pathological processes. Fiessinger considers the leukocyte a veritable gland cell with more complex functions than, for example, the pancreatic cell, and Chauffard in the introduction to Fiessinger's book goes so far as to speak of the leukocyte as a unicellular endocrine gland, which finds in its plasmatic milieu its elements of nutrition, its sources of activity and ways of discharge. Very recently Carrel has endowed the leukocyte with still another property, that of secreting trophones or growth-promoting substances.

Among the leukocytic ferments described by Fiessinger are oxydases, catalases, reductases, proteases, peptases, desaminases, lipases, lecithinases, amylases, etc. The technique of studying these various ferments is described, also their physiological and pathological properties, and, in the last chapter, their therapeutic applications.

Leukocytotherapy is of two kinds, autoleukocytotherapy and heteroleukocytotherapy; the former is exemplified by all cases of toxic intervention, that is intervention with proteins or proteoses, which, except in cases of shock with leukopenia, act through leukogenesis. Every interference that breaks the colloidal equilibrium of the body calls forth a leukocytosis, and such leukocytosis promotes a favorable reaction of the body to infections.

Heteroleukocytotherapy is employed under two forms: (*a*) leukocytic substances derived from an aseptic abscess in an animal, or (*b*) extracts derived from sterilized material from a septic focus in man. In the first the leukocytic ferments act in a pure state; in the second they are associated in action with bacterial ferments.

There is a good deal of promise in these methods, although they are as yet largely in the experimental stage. In the nature of things they are less exact than chemotherapeutic methods, but no doubt improvement in technique, particularly better ways of determining the ferment content, will soon be available. On account of the general importance of leukocytic ferments, chiefly in the domain of therapy, Fiessinger's book will prove of value to the clinician as well as to the laboratory worker.

D. R.

NATIONAL HEALTH SERIES. The Funk & Wagnalls Company, New York, 1924. Price per volume 30 cents; complete set of twenty volumes, $6.

The first five tiny volumes published by the Funk & Wagnalls Company for the National Health Council have just appeared. They deal with "Cancer: Its Nature, Diagnosis and Cure," by Francis C. Wood, M.D., Director of the Institute for Cancer Research, Columbia University; with "Man and the Microbe," by C. E. A. Winslow, Professor of Public Health at Yale; "Community Health: How to Obtain and Preserve It," by D. B. Armstrong, M.D., the Executive Officer of the National Health Council; "The Baby's Health," by Richard A. Bolt, M.D., Director of the Medical Service, American Child Health Association; and last of all "Personal Hygiene or the Rules for Right Living," by Allan J. McLaughlin, M.D., Surgeon in the U. S. Public Health Service.

The remaining volumes are expected to be on the market by May 1, 1924, and cover

amongst other themes such subjects as "Taking Care of Your Heart," "Food for Health's Sake," "The Child in School," "Tuberculosis," "Love and Marriage," "Venereal Diseases," "The Expectant Mother," "Adolescence," and "Home Care for the Sick."

As each volume is no larger than an ordinary note-book and covers less than 100 pages, it can be readily carried in the side pocket of one's coat.

Manifestly these volumes are intended much more for the laity than for medical men, but they are prepared by writers who hold such high rank that physicians may feel confident that the statements which they contain are reasonable and correct. So much pseudo-medical material is placed upon the market that physicians look somewhat askance at popular medical works intended for the laity. This series so far seems to avoid the criticism which can be justly made as to such publications in the past. Manifestly some of the themes deal with rather delicate matters. We trust that when these volumes appear they may be as reliable and worthy of commendation as the five to which we have just called attention.

Notes and Queries

The Peculiar Effects of Moonshine Whisky.

In an editorial on this subject, *The Long Island Medical Journal* for March, 1924, states that whisky of the present day often has effects which were not generally expected in the days before prohibition. The causes of these effects are discussed by Doran and Beyer in the *American Journal of Public Health* for October, 1923, in an article entitled "Character of Moonshine Liquor." The authors have based their conclusions on analyses of 75,000 samples of liquors officially collected and tested—mostly for court purposes. The information contained in the contribution is valuable to every practitioner of medicine, and an abstract of the article is herewith presented.

The authors state that statistics regarding the amount of alcoholism are unreliable, but fragmentary reports by the press, hospital staffs and public officials show that while alcoholism is now less prevalent than formerly, its attendant and after-effects are more serious.

The bad effects of the newer whiskies have been observed in three waves: First, there were cases resulting from liquors prepared from redistilled alcohols and from the use of toilet waters, proprietary remedies, and other manufactured products containing alcohol. This form of indulgence assumed considerable proportions soon after prohibition went into effect, but is now of infrequent occurrence. It never assumed dangerous proportions.

The second form of deadly alcoholic liquor was that containing wood alcohol. This liquor produced blindness and death with a considerable degree of certainty. The numerous cases of serious effects that were reported in the daily press have led to the education of the public and of the makers of liquors, and the amount of liquor containing wood alcohol is progressively lessening; but wood alcohol is still found in liquors made from denatured alcohol by persons who are ignorant of its composition.

The third menacing form of whisky is that produced in domestic stills—popularly called "moonshine" whisky. This is being produced in increasing amounts, partly because it is easily made and sold, and partly because the people generally have been educated regarding the dangers of wood alcohol whisky, and suppose that the "pure corn whisky" is devoid of special poisonous qualities. But this belief is ill

founded. It is well known that this whisky often produces an utter loss of memory of what happened soon after a drink or two has been taken; and also that complete unconsciousness is likely to follow the taking of a few drinks, even by those who could endure the old-time whisky.

Doran and Beyer discuss the causes of poisonous qualities of moonshine liquor, and give tables of the proportions of five deleterious products found in numerous samples. These five constituents are acids, aldehydes, furfur, fusel oil, and esters. The authors show that fusel oil is not the peculiar ingredient to which the poisonous qualities of moonshine whisky are due, because the amount of fusel oil increases with the age of the whisky, and the most innocuous old whisky contains it in the largest percentage. Neither are acids, furfur, or esters the poisonous substances. The guilty ingredients are the aldehydes.

The oxidation of alcohol produces a series of products of which the aldehydes contain the least oxygen and acetic acid the most. It is popularly known that the first product of fermentation is alcohol, and that the last product is acetic acid, as is seen in the fermentation of apple juice; the presence of excessive amounts of aldehydes in moonshine whisky is the result of a souring process in the amateur fermentation of the mash of which the whisky is made. When the sour mash is distilled, the aldehydes are abundant in the "heads," or the product that is first condensed; and the fusel oil content is especially large in the "tails," or that which is condensed last. The aldehyde content is also reduced by redistillation, and by aging, or storing, the product for months or years. Experience had taught the old mountain moonshiner that a safe whisky product depended on four things: (1) good yeast, and properly controlled fermentation; (2) the rejection of the heads and tails; (3) redistillation; and (4) aging. None of these essentials are observed by the domestic, get-rich-quick distillers of modern bootleg whisky; and their product has a deadliness exceeding that of the moonshine whisky of the professional mountaineer distiller, who dispenses his product to neighbors who know him well and are ready to take quick revenge if his product shows unsually poisonous qualities.

The authors quote the reports of experiments on the effects of aldehydes on animals. Rabbits subjected to their effects for several days frequently showed arteriosclerosis. More rarely they showed cirrhosis of the liver, and changes in the kidneys and the mucous membrane of the stomach.

The acute effect of aldehydes is a rapid intoxication with loss of sensibility and profound stupor, and with a depression of respiration and temperature. Animal experimentations with aldehydes confirm the clinical observations made on human beings poisoned by moonshine whisky.

The prevention of the bad effects of moonshine whisky depends on public enlightenment and education. The daily press may well be credited with the elimination of the menace of wood alcohol, for it has persistently published the accounts of cases of blindness and death.

Too Much Legislation as to Medical Practice.

The United States not only leads the world in quantity production of laws but also in breaking them, it is asserted by Dr. James H. Beal, chairman of the Board of Directors of the American Pharmaceutical Association, and regarded as the leader of pharmaceutical thought in this country.

Dr. Beal condemns legislative enactments which favor the survival of the unfit, adding: "What is compulsory morality worth? If the absence of visible acts of wrongdoing be the measure of morality, where do we find a more virtuous class of citizens than those who populate our State penitentiaries?"

In restrictions upon the proper medicinal use of drugs he sees an example of sacri-

ficing the interests of the many to the sins of the few, declaring that the hardships mainly fall on the physician and the pharmacist, who are the legitimate distributors, and on the sick.

"It is becoming increasingly difficult for pharmaceutical manufacturers to obtain sufficient of these agents for their needs, and if the present plans of certain enthusiasts should succeed they will become practically unobtainable for medicinal purposes, because illegitimate distributors will absorb the whole available supply of the crude drugs in the countries of their origin," says Dr. Beal, first Remington medalist, in a statement made public by the Drug Trade Bureau of Public Information.

"A simple prohibition of the sale of these drugs except for medicinal purposes would do all that the present cumbrous and costly machinery can do to control illicit traffic, and would not interfere with their proper medicinal use.

"This reminds us that there are many other valuable items of materia medica that are also capable of misuse. Shall we successively withdraw these valuable agents from medicinal use as rapidly as the degenerate members of society discover their potency for evil, knowing as we do from experience that the bootlegger and his customer will continue to obtain a supply even if the physician and his innocent patients are deprived of them?

"No one will deny the boon of public care to those who are incapable of caring for themselves, but we may very properly challenge the theory that the first duty of society is to its unfit members, or that the normal man must be restrained from exercising self-control because the subnormal man cannot control himself. It is highly illogical, deadly to initiative, and destructive to the general morale to subject a whole people to the methods of institutional restraint because of a minority that cannot otherwise be restrained.

"We seem to have reached a stage of mental evolution where we are more influenced by particular instances than by general and fundamental principles, and are thoughtlessly ready to surrender some of the most essential guarantees of liberty in order to obtain quick results.

"A favorite method with reformers is to show that many inmates of charitable and penal institutions have had some particular habit, from which they deduce the conclusion that the bulk of poverty and crime is due to use of the thing they propose to prohibit, which is by no means a necessary deduction."

Dr. Beal cites the Federal Food and Drug Act as a sane and practical measure, consisting mainly of a few simple definitions and a comparatively small number of direct prohibitions.

"It does not," continues Dr. Beal, "station a government inspector at the door of the factory or laboratory, does not require the giving of bonds or the taking out of permits to engage in business, and does not impose a costly and burdensome system of records and sworn reports. In simple and concise terms it tells the manufacturer and dealer what they are prohibited from doing, and then directs the whole energies of the enforcing bureau to the detection and punishment of the prohibited acts."

Though a vastly greater number of new laws are enacted annually by our Congress than by the British Parliament, offenses against the public order are more numerous in this country. Within the same period of time, according to Dr. Beal, the city of New York had six times as many homicides as the city of London; Chicago had twelve times as many; and Cleveland, with about one-tenth the population of London, had more than three times as many, or in the proportion of thirty to one.

"If all the people who ever violated a law were in jail, there would not be enough citizens at liberty to furnish bread and water for the prisoners."—*News Service, Drug Trade Bureau of Public Information.*